

Virginia Ambient Air Monitoring 2002 Data Report



Department of Environmental Quality

**Commonwealth of Virginia
Department of Environmental Quality**



**Submitted by
Air Quality Monitoring
Office of Air Quality Planning & Monitoring**

**This Ambient Air Monitoring Data Report is for the time period
of January 1, 2002 to December 31, 2002**

On The Cover

Virginia's State Bird - The Cardinal

Virginia's State Tree - The Dogwood

Virginia's State Insect - The Swallowtail Butterfly

Robert G. Burnley, Director

Virginia Department of Environmental Quality

John M. Daniel, Jr.

Director, Air Division

James E. Sydnor

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Acknowledgments:

Thanks to John M. Daniel, Jr., James E. Sydnor, James Dinh, Tom Jennings, Carolyn Stevens, Dan Salkovitz, Baxter Gilley and Charles (Brian) King.

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May 12, 2003

CERTIFICATION

Air quality data reported by the Virginia Department of Environmental Quality are collected using EPA certified equipment and procedures at sites meeting EPA siting criteria. The data summarized in this report for calendar year 2002 are accurate to the best of my knowledge.

John M. Daniel Jr.
John M. Daniel, Jr., P.E., DEE
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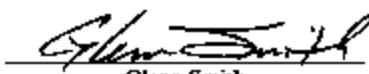
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28 April 2003

CERTIFICATION

The Fairfax County Air Quality Monitoring Program's portion of the air quality data reported by the Virginia Department of Environmental Quality was collected using EPA certified equipment and procedures at sites meeting EPA siting criteria. The data summarized in this report for calendar year 2002 are accurate to the best of my knowledge.



Glenn Smith
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CERTIFICATION

That portion of the Virginia air quality data collected by the City of Alexandria Transportation and Environmental Services Division of Environmental Quality was collected using EPA certified equipment and procedures at sites meeting EPA siting criteria. The data submitted and summarized in this report for calendar year 2002 are accurate to the best of my knowledge.

May 7, 2003

Ken Whitlock

Ken Whitlock
Environmental Specialist
Division of Environmental Quality
City of Alexandria Transportation &
Environmental Services

ABBREVIATION TABLE

#N	Number of Samples
AQA	Air Quality Assessment
AQCR	Air Quality Control Region
ARITH.	Arithmetic
ATMN	Air Toxics Monitoring Network
CAS RN	Chemical Abstracts Service Registered Number
(CM)	Continuous Monitor
CO	Carbon Monoxide
CONC	Concentrations
DEQ	Department of Environmental Quality
DISC	Discontinued
EPA	Environmental Protection Agency
GC/MSD	Gas Chromatograph/Mass Spectrometry Detector
GC/FID	Gas Chromatograph/Flame Ionization Detector
IMPROVE	Interagency Monitoring of Protected Visual Environments
LAT	Latitude
LONG	Longitude
Met.	Meteorological Instrumentation
MSA	Metropolitan Statistical Area
NA	Not Available
NAAQS	National Ambient Air Quality Standards
NAMS	National Air Monitoring Station(s)
NMOC	Non-Methane Organic Compounds
NO₂	Nitrogen Dioxide
OBS.	Observations
O₃	Ozone
PAMHC	Total PAMS Hydrocarbon
PAMS	Photochemical Assessment Monitoring Station
PM₁₀	Particulate Matter with an aerodynamic diameter less than or equal to 10 microns
PM_{2.5}	Particulate Matter with an aerodynamic diameter less than or equal to 2.5 microns
POLLUT.	Pollutant
ppbC	Part Per Billion of Carbon
ppbv	Part Per Billion of Volume
ppm	Part Per Million
SEC.STD.	Secondary Standard
SLAMS	State and Local Air Monitoring Station(s)
SO₂	Sulfur Dioxide
SPM	Special Purpose Monitor
STD	Standard
STDev	Standard Deviation
TERM	Terminated
TNMOC	Total Nonmethane Organic Compound
ug/m³	Micrograms per cubic meter
VOC	Volatile Organic Compounds

INTRODUCTION

The 2002 Virginia Ambient Air Monitoring Data Report is a compilation of air pollutant measurements made by the Virginia Department of Environmental Quality, the City of Alexandria, and Fairfax County. This report satisfies the requirements of the U.S. Environmental Protection Agency (EPA) for the reporting of air quality data as specified in the Code of Federal Regulations, Title 40, Part 58, Appendix F.

Ambient air quality was measured at 54 locations within the Commonwealth during 2002. These monitoring sites were established in accordance with EPA's siting criteria contained in 40 CFR Part 58, Appendices D and E. Monitoring network operations conformed to EPA guidance documents and generally accepted air quality monitoring practices. All data reported for these monitoring sites were quality assured in accordance with requirements contained in 40 CFR Part 58, Appendix A.

Ambient concentrations of carbon monoxide, nitrogen dioxide, and sulfur dioxide were within the EPA's national ambient air quality standards (NAAQS) in 2002. Virginia continues to experience problems with summertime ozone pollution, particularly in Northern Virginia, Richmond, and Hampton Roads. In 2002, Northern Virginia had six days when a one-hour ozone average greater than .12 ppm was recorded at one or more monitoring stations in the area. Richmond had five days, and Hampton Roads had three days greater than .12 ppm.

Implementation of the stricter 8-hour ozone standard has begun, following a delay resulting from several years of litigation. Two areas of the state that have not historically experienced problems meeting the ozone NAAQS are potentially facing nonattainment with the 8-hour ozone standard. In particular, the Roanoke and Winchester areas exceeded the 8-hour ozone standard for the period from 2000-2002. To address the possibility of ozone nonattainment, these two areas signed Early Action Compacts (EACs) in December 2002. EACs are plans that are designed to reduce ozone precursor pollutants and improve air quality in an area prior to receiving an official nonattainment designation by EPA. In exchange, these areas may receive a delay in the effective date of the nonattainment designation, and the requirements that accompany that designation. EPA is planning to announce official ozone nonattainment area designations by April 15, 2004.

Virginia is meeting the NAAQS for PM10 (particulate matter with an aerodynamic diameter equal to or less than 10 microns). Also, the 24-hour standard for fine particulate matter (PM2.5) is being met in all areas, and the annual standard for PM2.5 is being met everywhere in the state except the Roanoke/Salem and Bristol areas. PM2.5 speciation monitors, operating on a 1-in-6-day sampling schedule, were installed in those two areas in November 2001. The data collected through the end of 2002 indicate that two main components of fine particulate in those areas are carbon and sulfates. Speciation data will aid in the development of a strategy to attain the PM2.5 annual standard if Bristol and Roanoke are designated nonattainment. EPA plans to officially designate PM2.5 nonattainment areas by December 2004.

**AREAS IN VIRGINIA DESIGNATED AS
NONATTAINMENT FOR THE 1-HOUR OZONE
NATIONAL AMBIENT AIR QUALITY STANDARD**

Northern Virginia Ozone Nonattainment Area [severe]

Arlington County	Alexandria City
Fairfax County	Fairfax City
Loudoun County	Falls Church City
Prince William County	Manassas City
Stafford County	Manassas Park City

The Richmond and Hampton Roads areas are in attainment with the 1-hour ozone standard. Both areas have maintenance plans in place to promote continued attainment of the standard.

All other areas of the Commonwealth are in attainment with the National Ambient Air Quality Standards.

DATA CAPTURE CRITERIA

<u>Minimum Number of Observations</u>	
3-hour average	3 consecutive hourly observations
8-hour	6 hourly observations
24-hour	18 hourly observations
Quarterly averages (PM _{2.5} , PM ₁₀)	75% of scheduled samples
Yearly averages (Continuous Instruments)	75% of total possible observations
Yearly averages (PM _{2.5} , PM ₁₀)	Four complete quarterly averages

National Ambient Air Quality Standards

National Ambient Air Quality Standards (NAAQS), published by the Environmental Protection Agency (EPA) in connection with the Clean Air Act and 40 CFR, Part 50, are listed below.

On July 17, 1997, the EPA announced changes to the NAAQS for ozone and particulate matter. EPA is phasing out the 1-hour ozone standard, and replacing it with an 8-hour standard. For particulate matter, a standard for PM_{2.5} has been added while retaining the PM₁₀ standard. EPA determined that these changes were necessary to protect public health and the environment. See introduction on page 5 for information regarding recent developments with the NAAQS.

POLLUTANT	PRIMARY STANDARD		SECONDARY STANDARD	
	ug/m³	ppm	ug/m³	ppm
CARBON MONOXIDE				
8-hour concentration	10,000 ^a	9 ^a		
1-hour concentration	40,000 ^a	35 ^a		
SULFUR DIOXIDE				
Annual arithmetic mean	80	0.03		
24-hour concentration	365 ^a	0.14 ^a		
3-hour concentration			1300 ^a	0.50 ^a
NITROGEN DIOXIDE				
Annual arithmetic mean	100	0.053	Same as primary	
OZONE				
8-hour concentration	157 ^b	0.08 ^b	Same as primary	
1-hour concentration	235 ^c	0.12 ^c		
LEAD				
Quarterly arithmetic mean	1.5		Same as primary	
PARTICULATE MATTER				
PM_{2.5}				
Annual arithmetic mean	15 ^d			
24-hour concentration	65 ^e			
PM₁₀				
Annual arithmetic mean	50 ^d		Same as primary	
24-hour concentration	150 ^f			

^a Not to be exceeded more than once a year

^b 3-year average of the 4th highest 8-hour concentration may not exceed 0.08 ppm

^c Not more than 1 exceedance per year, averaged over 3 years

^d Based on a 3-year average of annual averages

^e Based on a 3-year average of annual 98th percentile values

^f Based on a 3-year average of annual 99th percentile values

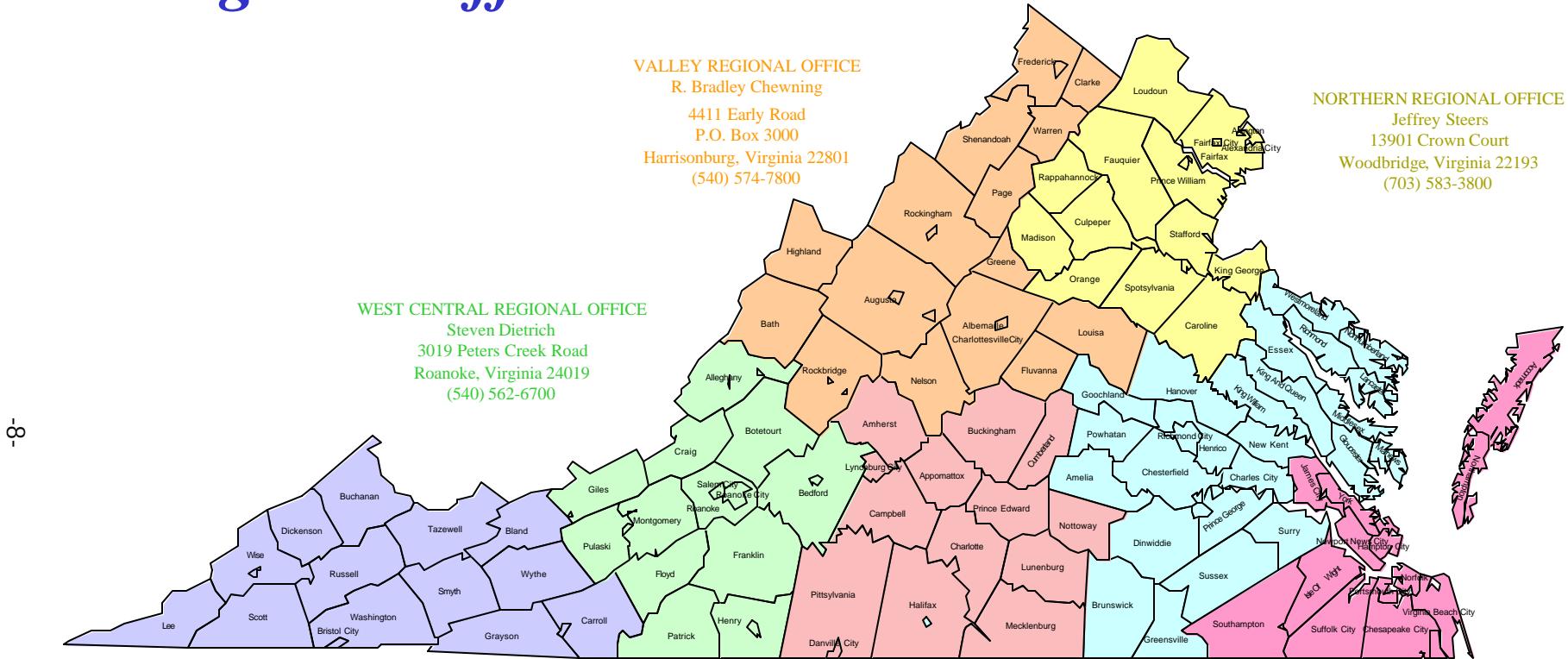
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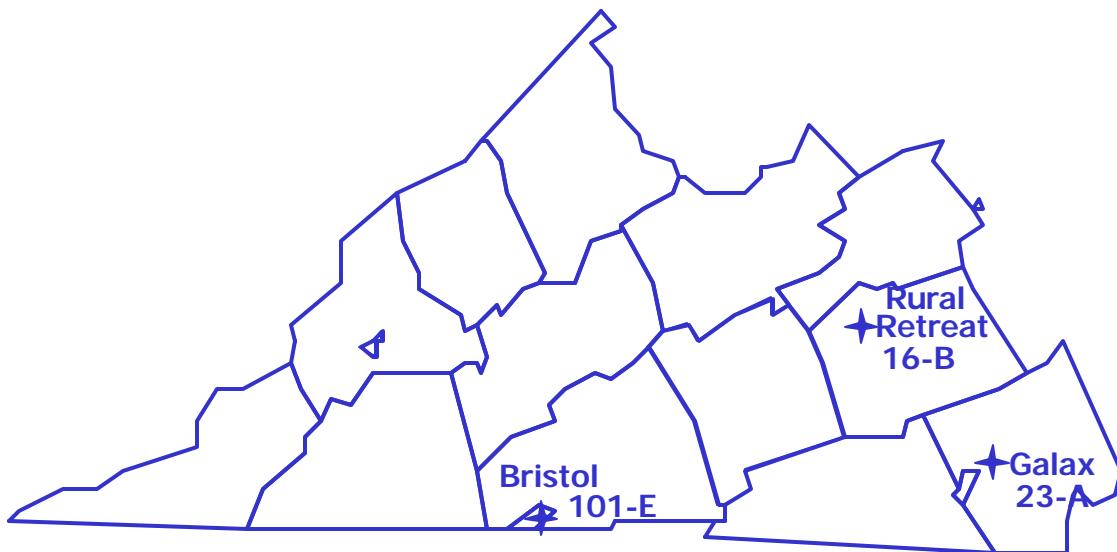
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AIR SATELLITE OFFICES

**VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY
AMBIENT AIR MONITORING SITE LIST
2002**

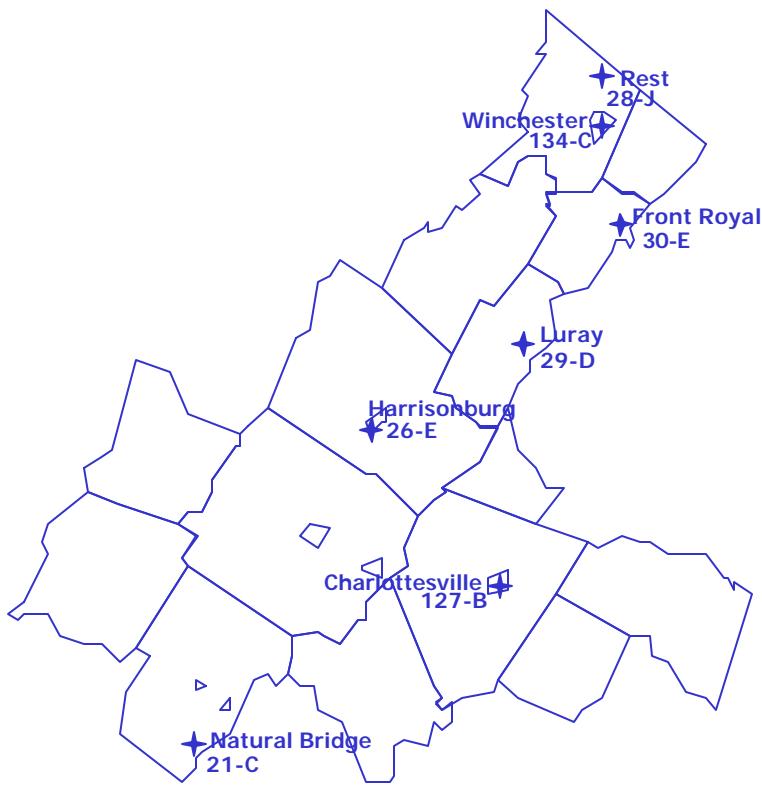
SOUTHWEST MONITORING NETWORK



STATION NUMBER	POLLUT.	SITE TYPE	LOCATION	AIRS NUMBER	CITY/ COUNTY	LAT/ LONG
16-B	O ₃	SLAM S	Sewage Disposal Plant	51-197-0002	Rural Retreat Wythe Co.	36° 53' 35" 81° 15' 18"
23-A	PM ₁₀	SLAM S	Gladeville Elementary School	51-035-0001	Galax Carroll Co.	36° 42' 09" 80° 52' 48"
101-E	PM _{2.5} , Speciation	SLAM S SPM	Highland View Elementary School	51-520-0006	Bristol	36° 36' 28" 82° 09' 52"

**VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY
AMBIENT AIR MONITORING SITE LIST
2002**

VALLEY MONITORING NETWORK



STATION NUMBER	POLLUT.	SITE TYPE	LOCATION	AIRS NUMBER	CITY/ COUNTY	LAT/ LONG
21-C	O ₃	SLAMS IMPROVE	Natural Bridge Ranger Station	51-163-0003	Rockbridge Co.	37° 37' 34" 79° 30' 47"
26-E	PM ₁₀ , SO ₂	SLAMS	Valley DEQ Office 4411 Early Road	51-165-0002	Harrisonburg Rockingham Co.	38° 23' 22" 78° 54' 51"
28-J	O ₃	SLAMS	Woodbine Road Lester Building Systems	51-069-0010	Rest Frederick Co.	39° 16' 58" 78° 04' 53"
29-D	O ₃ , PM _{2.5}	SLAMS	Luray Caverns Airport	51-139-0004	Luray Page Co.	38° 39' 48" 78° 30' 17"
30-E	PM ₁₀	SLAMS	Warren Co. Memorial Hospital 1000 Shenandoah Avenue	51-187-0004	Front Royal Warren Co.	38° 55' 58" 78° 11' 54"
127-B	PM ₁₀	SLAMS	City Hall Annex 606 E. Market Street	51-540-0002	Charlottesville	38° 01' 57" 78° 28' 37"
134-C	PM ₁₀	SLAMS	Winchester Courts Building	51-840-0002	Winchester	39° 11' 08" 78° 09' 47"

**VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY
AMBIENT AIR MONITORING SITE LIST
2002**

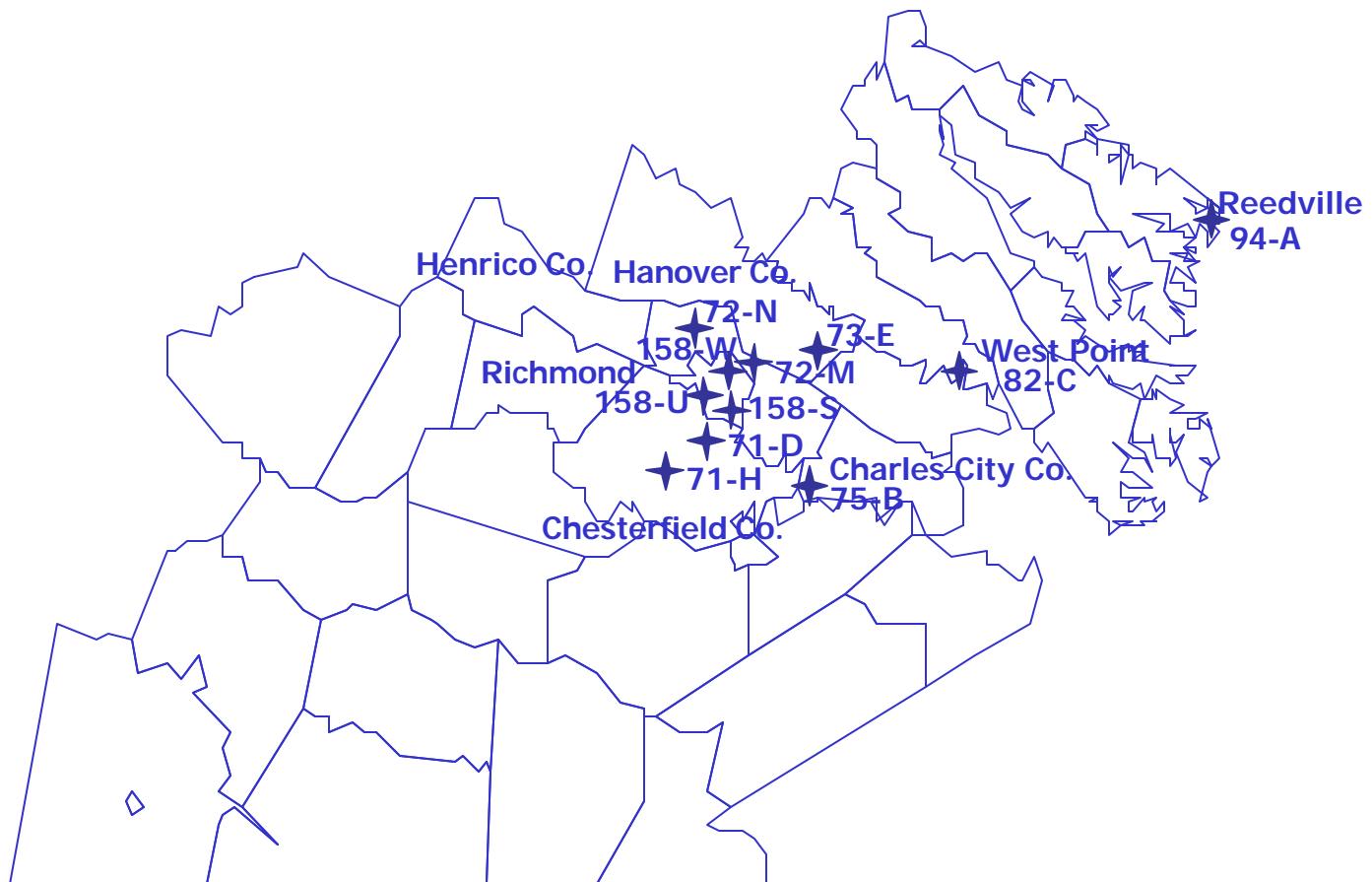
WEST CENTRAL MONITORING NETWORK



STATION NUMBER	POLLUT.	SITE TYPE	LOCATION	AIRS NUMBER	CITY/ COUNTY	LAT/ LONG
19-A6	SO ₂ , NO ₂ , O ₃	NAMS/ SLAMS	East Vinton Elementary School Ruddell Road	51-161-1004	Vinton Roanoke Co.	37° 17' 08" 79° 53' 03"
109-H	PM ₁₀	SLAMS	101 Cherry Hill Circle	51-770-0011	Roanoke	37° 16' 33" 79° 59' 58"
109-J	CO	SLAMS	Carver Road & Courtland Drive	51-770-0013	Roanoke	37° 17' 05" 79° 56' 01"
109-L	PM _{2.5} , Speciation	SLAMS SPM	Raleigh Court Library	51-770-0014	Roanoke	37° 15' 22" 79° 59' 06"
110-B	PM _{2.5}	SLAMS	Market St. Fire Station	51-775-0010	Salem	37° 17' 31" 80° 03' 25"
155-P	PM _{2.5}	SLAMS	Central Va. Community College	51-680-0014	Lynchburg	37° 21' 24" 79° 10' 31"

**VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY
AMBIENT AIR MONITORING SITE LIST
2002**

PIEDMONT MONITORING NETWORK



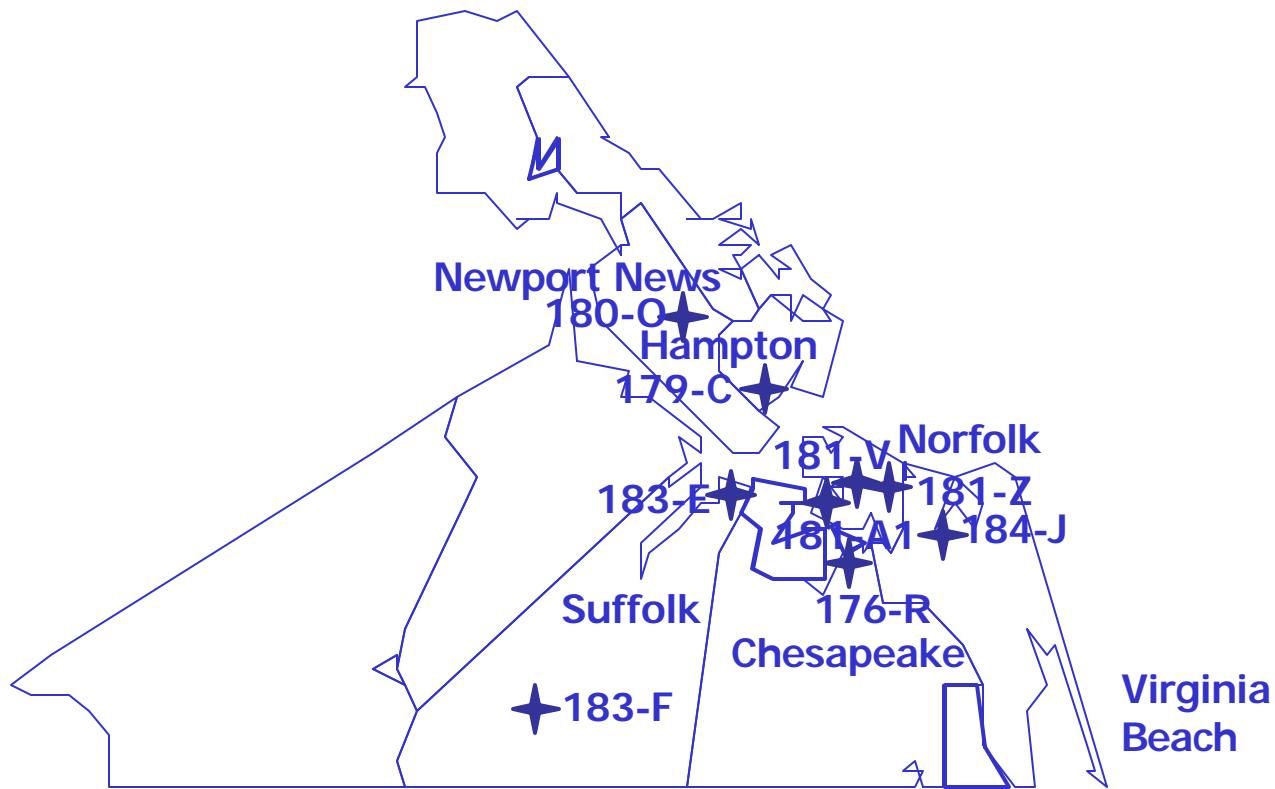
STATION NUMBER	POLLUT.	SITE TYPE	LOCATION	AIRS NUMBER	CITY/COUNTY	LAT/ LONG
71-D	PM _{2.5}	SLAMS	Bensley Armory	51-041-0003	Chesterfield Co.	37° 26' 10" 77° 27' 03"
71-H	O ₃	SLAMS	Beach Road Highway Shop	51-041-0004	Chesterfield Co.	37° 21' 32" 77° 35' 37"
72-M	O ₃ , VOC, PM _{2.5}	NAMS/ SLAMS	Math and Science Center 2401 Hartman Street	51-087-0014	Henrico Co.	37° 33' 30" 77° 24' 01"
72-N	PM _{2.5}	SLAMS	DEQ - Piedmont Regional Office 4949A Cox Road	51-087-0015	Henrico Co.	37° 40' 13" 77° 34' 03"
73-E	O ₃	NAMS	McClellan Road	51-085-0003	Hanover Co.	37° 36' 21" 77° 13' 07"

PIEDMONT (Cont.)

STATION NUMBER	POLLUT.	SITE TYPE	LOCATION	AIRS NUMBER	CITY/COUNTY	LAT/ LONG
75-B	O ₃ , NO ₂ , SO ₂ , PM _{2.5}	NAMS/ SLAMS	Charles City County Route 608	51-036-0002	Charles City Co.	37° 20' 31" 77° 15' 39"
82-C	PM ₁₀	SLAMS	West Point Elementary School Thompson Ave. and Chelsea Road	51-101-0003	West Point King William Co.	37° 33' 34" 76° 47' 43"
94-A	PM ₁₀	SLAMS	Pumping Station Main Street	51-133-0001	Reedville Northumberland Co.	37° 50' 25" 76° 16' 44"
158-S	PM ₁₀ , PM _{2.5} , Speciation	NAMS/ SLAMS SPM	DEQ - Air Quality Monitoring 5324 Distributor Drive	51-760-0020	Richmond	37° 30' 38" 77° 29' 54"
158-U	CO	SLAMS	Forest Hill Fire Station 7410 Forest Hill Avenue	51-760-0022	Richmond	37° 32' 22" 77° 31' 58"
158-W	CO, SO ₂ , NO ₂	SLAMS	Science Museum of Virginia DMV and Leigh Street	51-760-0024	Richmond	37° 33' 45" 77° 27' 55"

**VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY
AMBIENT AIR MONITORING SITE LIST
2002**

TIDEWATER MONITORING NETWORK



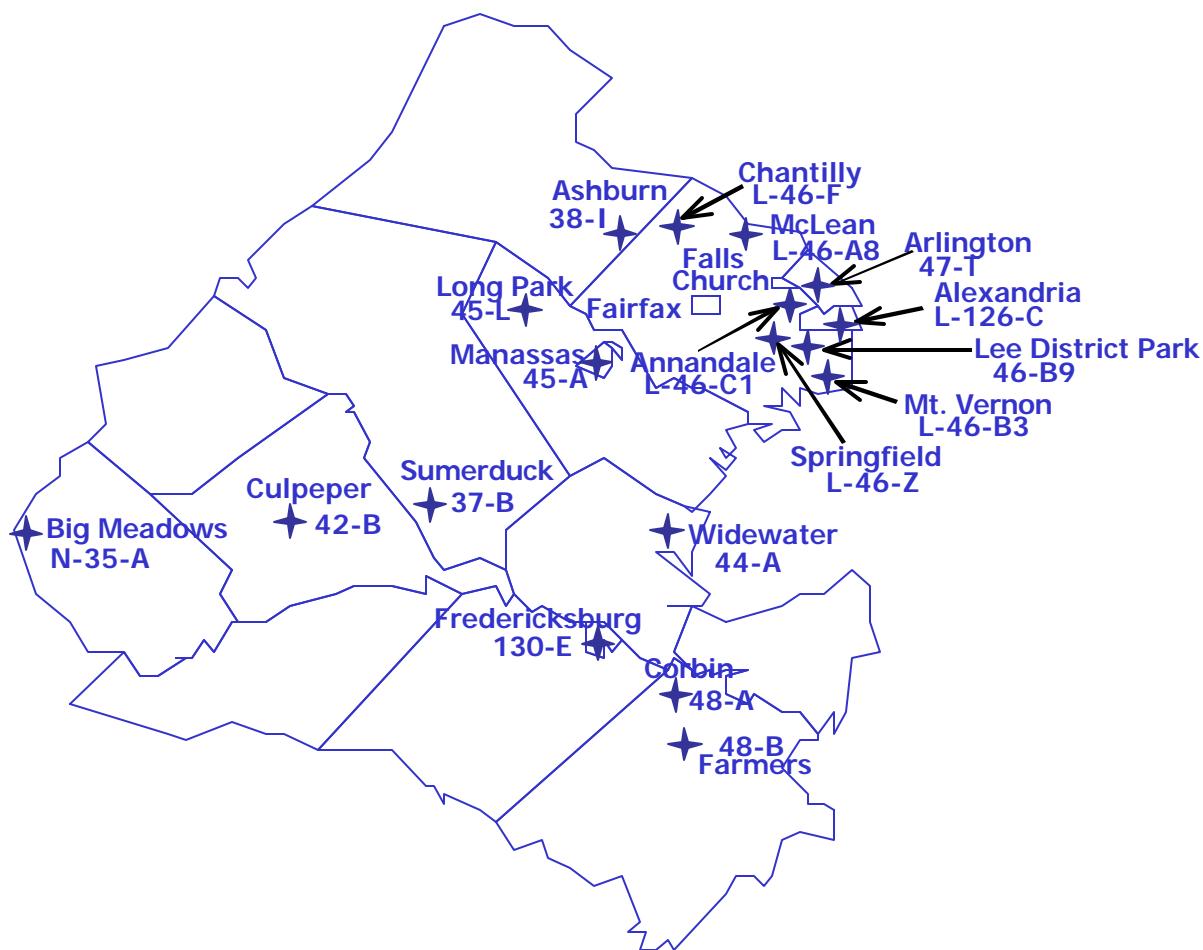
STATION NUMBER	POLLUT.	SITE TYPE	LOCATION	AIRS NUMBER	CITY/COUNTY	LAT/ LONG
176-R	PM ₁₀ , PM _{2.5}	NAMS/ SLAMS	Oscar Smith Middle School Stadium 2500 Rodgers Street	51-550-0012	Chesapeake	36° 48' 14" 76° 16' 21"
179-C	PM ₁₀ , CO, SO ₂ , O ₃ PM _{2.5}	NAMS/ SLAMS	Virginia School for the Deaf & Blind 700 Shell Road	51-650-0004	Hampton	37° 00' 12" 76° 23' 57"
180-O	PM _{2.5}	SLAMS	Pump Station 103	51-700-0013	Newport News	37° 05' 59" 76° 28' 53"
181-A1	PM ₁₀ , PM _{2.5}	SLAMS	NOAA Property 2nd and Woodis Avenue	51-710-0024	Norfolk	36° 51' 28" 76° 18' 06"
181-V	CO	NAMS	Post Office 600 Church Street	51-710-0019	Norfolk	36° 51' 12" 76° 16' 43"

TIDEWATER (Cont.)

STATION NUMBER	POLLUT.	SITE TYPE	LOCATION	AIRS NUMBER	CITY/COUNTY	LAT/ LONG
181-Z	CO, SO ₂ , NO ₂	NAMS/ SLAMS	Norfolk State University	51-710-0023	Norfolk	36° 51' 01" 76° 15' 28"
183-E	O ₃	NAMS	Tidewater Community College Frederick Campus	51-800-0004	Suffolk	36° 54' 12" 76° 26' 19"
183-F	O ₃	NAMS	Tidewater Research Station Route 610	51-800-0005	Suffolk	36° 40' 03" 76° 43' 53"
184-J	PM _{2.5}	SLAMS	DEQ - Tidewater Regional Office 5636 Southern Blvd.	51-810-0008	Va. Beach	36° 50' 28" 76° 10' 53"

**VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY
AMBIENT AIR MONITORING SITE LIST
2002**

NORTHERN VA. MONITORING NETWORK



STATION NUMBER	POLLUT.	SITE TYPE	LOCATION	AIRS NUMBER	CITY/ COUNTY	LAT/ LONG
37-B	O ₃	SLAMS	Phelps Wildlife Area Route 651	51-061-0002	Sumerduck Fauquier Co.	38° 28' 30" 77° 46' 04"
38-I	NO ₂ , O ₃ , PM _{2.5}	SLAMS	Broad Run High School Route 641	51-107-1005	Ashburn Loudoun Co.	39° 01' 28" 77° 29' 24"
42-B	PM ₁₀	SLAMS	Farmington Elementary School Sunset Lane	51-047-0002	Culpeper Culpeper Co.	38° 27' 26" 78° 00' 40"
44-A	O ₃	SLAMS	Widewater Elementary School Den Rich Road	51-179-0001	Widewater Stafford Co.	38° 28' 59" 77° 22' 13"

NORTHERN VA. (Cont.)

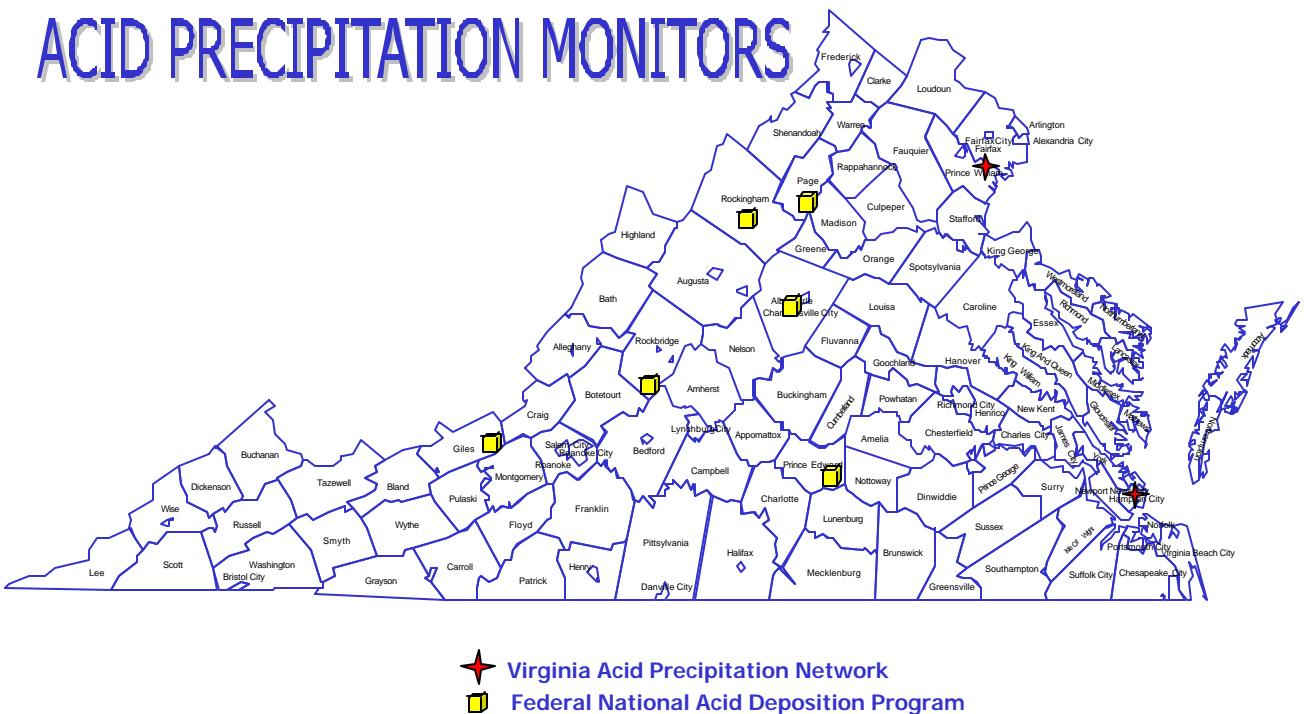
STATION NUMBER	POLLUT.	SITE TYPE	LOCATION	AIRS NUMBER	CITY/COUNTY	LAT/ LONG
45-A	PM ₁₀	SLAMS	Manassas Health Department 9301 Lee Avenue	51-153-0001	Manassas Prince William Co.	38° 45' 11" 77° 28' 39"
45-L	O ₃ , NO ₂	SLAMS	Long Park Route 15	51-153-0009	Prince William Co.	38° 51' 19" 77° 38' 08"
46-B9	PAMS, NO _y , O ₃ , CO, PM _{2.5}	PAMS	Lee District Park Telegraph Road	51-059-0030	Franconia Fairfax Co.	38° 46' 22" 77° 06' 20"
47-T	CO, NO ₂ , O ₃ , PM _{2.5}	SLAMS	Aurora Hills Visitors Center 18th and Hayes Streets	51-013-0020	Arlington Co.	38° 51' 27" 77° 03' 33"
48-A	O ₃ , NO ₂ , NO _y , VOC	PAMS	U.S.G.S. Geomagnetic Center	51-033-0001	Corbin Caroline Co.	38° 12' 11" 77° 22' 38"
48-B	MET.	PAMS	VDOT Residency Shop Route 2	51-033-0002	Farmers Caroline Co.	38° 04' 54" 77° 21' 49"
130-E	PM ₁₀	SLAMS	Hugh Mercer Elementary School 2100 Cowan Boulevard	51-630-0004	Fredericksburg	38° 18' 17" 77° 29' 11"
L-46-A8	CO, SO ₂ , NO ₂ , O ₃ , PM _{2.5}	SLAMS	McLean Governmental Center 1437 Balls Hill Road	51-059-5001	McLean Fairfax Co.	38° 55' 55" 77° 11' 56"
L-46-B3	PM ₁₀ , O ₃	SLAMS	Mt. Vernon Fire Station 2675 Sherwood Hall Lane	51-059-0018	Mount Vernon Fairfax Co.	38° 44' 33" 77° 04' 39"
L-46-F	CO, SO ₂ , NO ₂ , O ₃ , PM ₁₀	SLAMS	Upper Cub Run Drive	51-059-0005	Chantilly Fairfax Co.	38° 53' 38" 77° 27' 55"
L-46-Z	PM ₁₀	NAMS	Doctor's Exchange 6120 Brandon Avenue	51-059-3002	Springfield Fairfax Co.	38° 47' 01" 77° 10' 57"
L-46-C1	CO, SO ₂ , NO ₂ , O ₃ , PM _{2.5}	SLAMS	Mason Governemental Center 6507 Columbia Pike	51-059-1005	Annandale Fairfax Co.	38° 50' 15" 77° 09' 47"
L-126-C	CO, SO ₂ , NO ₂ , O ₃	NAMS/ SLAMS	Alexandria Health Department 517 North Saint Asaph Street	51-510-0009	Alexandria	38° 48' 38" 77° 02' 40
N-35-A	O ₃ ,SO ₂ PM _{2.5}	Non-EPA Fed. IMPROVE	Big Meadows, National Park Service	51-113-0003	Madison Co.	38° 31' 19" 78° 26' 10"

**TABLE OF THE NUMBER OF CRITERIA POLLUTANT
MONITORING SITES
NAMS/SLAMS 2002**

REGION	PM_{2.5}	PM₁₀	CO	SO₂	NO₂	O₃	TOTAL
Southwest	1	1	---	---	---	1	3
Valley	1	4	---	1	---	3	9
West Central	2	1	1	1	1	1	7
South Central	1	---	---	---	---	---	1
Piedmont	5	3	2	2	2	4	18
Tidewater	5	3	3	2	1	3	17
*Northern	5	6	6	4	8	12	41
TOTAL	20	18	12	10	12	24	96

* This includes sites operated by the DEQ, Fairfax Co. and Alexandria

ACID PRECIPITATION MONITORS

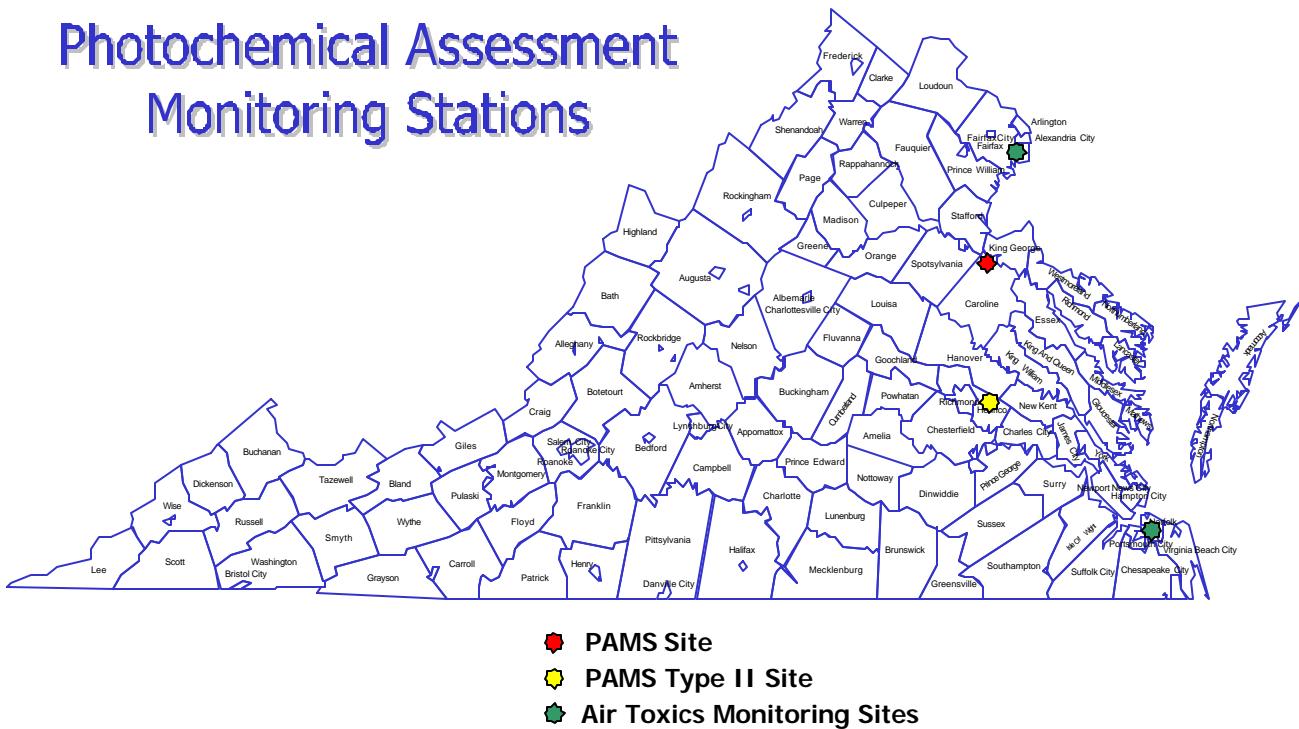


The Virginia Acid Precipitation Network (VAPN) consisted of two monitoring sites in 2002: Hampton, and Occoquan (Fairfax County). A third VAPN site, Rockbridge County, was converted to a National Acid Deposition Program site in July. The Virginia Department of Environmental Quality sponsors this site. VAPN weekly samples are collected and analyzed on site for pH and conductivity every Tuesday, and then mailed to the Department of General Services, Division of Consolidated Laboratory Services, Bureau of Chemistry, where the following chemical analyses are conducted: pH (laboratory), conductivity (laboratory), ammonium, chloride, sodium, potassium, magnesium, calcium, anion-cation balance, nitrate, sulfate, and phosphate. VAPN data and information are available upon request from the DEQ Air Division, Office of Data Analysis. VAPN site information and limited data are available on-line at <http://esm.versar.com/pprp/features/aciddep/regional.htm>.

"A Summary of Wet Deposition Data Collected in the Virginia Acid Precipitation Network, 1982-1997", prepared by the Maryland Power Plant Research Program in August 1998, is available on-line at <http://esm.versar.com/pprp/features/aciddep/Vapn.htm#report>.

The Federal National Acid Deposition Program (NADP) now has six monitoring sites in Virginia: Big Meadows (Shenandoah National Park), Hortons Station (Giles County), Charlottesville, Prince Edward County, Harrisonburg (Rockingham County) and Rockbridge County. National Acid Deposition Program site information and data are available on-line at <http://nadp.sws.uiuc.edu>.

Photochemical Assessment Monitoring Stations



In 2002, the Air Quality Monitoring (AQM) program of the Department of Environmental Quality operated two Photochemical Assessment Monitoring stations (PAMS) at Corbin in Caroline County, and the Mathematics and Science Center in Henrico County. Additionally, 24-hour PAMS Volatile Organic Compounds (VOC) samples were collected from two core Air Toxics Monitoring Network (ATMN) sites located on the property of the National Oceanic and Atmospheric Administration (NOAA) in Norfolk, and Lee District Park in Fairfax County, using a one in six day sampling schedule.

Corbin was operated all year as a PAMS Type I site, collecting one 24-hour VOC sample collected every six days (a Type I site measures upwind background ozone precursor concentrations). In addition episodic sampling was conducted on days forecasted to be high ozone alert days for the Washington-Baltimore area in the summer.

The Math and Science Center monitoring station was upgraded to a PAMS Type II site during the 2002 season, with one 24-hour VOC sample taken every six days, and four 3-hour carbonyl samples collected every third day from June through August (a Type II site measures maximum ozone precursor concentrations in the primary downwind direction on days conductive to ozone formation). In addition, hourly samples were collected using an Auto Gas Chromatograph, which was previously located at the PAMS Type IIA site at Lee District Park in Fairfax County (a Type IIA site measures maximum ozone precursors in the secondary downwind direction).

AQM used the manual method for collecting ambient air samples. This method involves the collection of integrated, whole air samples by using evacuated Summa^T canisters and Xontech air samplers. Each VOC sample from Corbin was analyzed by the Division of Consolidated Laboratory Services using a Gas Chromatograph/Flame Ionization Detector. Samples from Math and Science Center, Lee District Park, and NOAA were analyzed by the Maryland Department of the Environment, Air and Radiation Management Administration, using a Gas Chromatograph/Flame Ionization Detector. All VOC samples were analyzed for the presence of fifty-five target volatile organic precursors, and the

measured concentration of Total Nonmethane Organic Compounds (TNMOC).

Detailed PAMS data are available upon written request to the Virginia Department of Environmental Quality, Office of Air Quality Monitoring.

**2002 AVERAGE CONCENTRATION OF DETECTABLE VOLATILE OZONE PRECURSORS
PHOTOCHEMICAL ASSESSMENT MONITORING STATION (PAMS) TYPE I - Corbin, VA**

Concentrations are in ppbC

Parameter	Compound Name	#N	Minimum	Maximum	Median	Average	StDev
43203	Ethylene	59	0.15	4.31	1.17	1.41	0.83
43206	Acetylene	59	0.05	3.77	1.09	1.28	0.70
43202	Ethane	59	2.36	10.12	6.26	6.32	1.66
43205	Propylene	59	0.05	1.45	0.43	0.49	0.30
43204	Propane	59	0.50	9.64	3.79	4.01	1.89
43214	Isobutane	59	0.05	2.19	0.56	0.78	0.58
43280	1-butene	59	0.05	3.77	0.20	0.35	0.54
43212	n-butane	59	0.05	5.18	0.73	1.31	1.44
43216	t-2-butene	59	0.05	1.78	0.05	0.11	0.25
43217	c-2-butene	59	0.05	1.92	0.05	0.25	0.44
43221	Isopentane	59	0.05	10.67	1.96	2.33	1.84
43224	1-pentene	59	0.05	2.41	0.33	0.42	0.39
43220	n-pentane	59	0.05	2.91	0.92	0.97	0.57
43243	Isoprene	59	0.05	31.42	0.59	3.61	6.52
43226	t-2-pentene	59	0.05	15.40	0.05	0.37	1.99
43227	c-2-pentene	59	0.05	3.03	0.05	0.20	0.53
43244	2,2-dimethylbutane	59	0.05	0.51	0.19	0.21	0.11
43242	Cyclopentane	59	0.05	0.46	0.05	0.11	0.10
43284	2,3-dimethylbutane	59	0.05	5.79	0.24	0.70	1.23
43285	2-methylpentane	59	0.05	3.87	1.19	1.25	0.74
43230	3-methylpentane	59	0.05	1.98	0.49	0.57	0.38
43246	2-methyl-1-pentene	59	0.05	0.98	0.13	0.22	0.22
43231	n-hexane	59	0.09	1.54	0.52	0.57	0.30
43262	Methylcyclopentane	59	0.05	1.05	0.21	0.26	0.21
43247	2,4-dimethylpentane	59	0.05	0.94	0.19	0.22	0.20
45201	Benzene	59	0.14	2.26	0.94	1.11	0.49
43248	Cyclohexane	59	0.05	0.79	0.05	0.17	0.18
43263	2-methylhexane	59	0.05	1.32	0.28	0.31	0.25
43291	2,3-dimethylpentane	59	0.05	1.07	0.31	0.32	0.22
43249	3-methylhexane	59	0.05	2.53	1.08	1.13	0.54
43250	224-trimethylpentane	59	0.05	3.42	0.30	0.39	0.47
43232	n-heptane	59	0.05	0.84	0.22	0.25	0.15
43261	Methylcyclohexane	59	0.05	0.80	0.12	0.16	0.15
43252	234-trimethylpentane	59	0.05	0.67	0.17	0.19	0.14
45202	Toluene	59	0.16	4.33	1.35	1.55	0.85
43960	2-methylheptane	59	0.05	0.68	0.11	0.19	0.18
43253	3-methylheptane	59	0.05	3.08	0.22	0.68	0.77
43233	n-octane	59	0.05	3.78	0.13	0.24	0.50

**2002 AVERAGE CONCENTRATION OF DETECTABLE VOLATILE OZONE PRECURSORS
PHOTOCHEMICAL ASSESSMENT MONITORING STATION (PAMS) TYPE I - Corbin, VA (cont.)**
Concentrations are in ppbC

Parameter	Compound Name	#N	Minimum	Maximum	Median	Average	StDev
45203	Ethylbenzene	59	0.05	0.71	0.16	0.19	0.14
45109	m/p-xylene	59	0.05	1.71	0.51	0.55	0.37
45220	Styrene	59	0.17	4.73	1.86	1.87	1.06
45204	o-xylene	59	0.05	0.89	0.21	0.24	0.16
43235	n-nonane	59	0.05	0.62	0.13	0.15	0.11
45210	Isopropylbenzene	59	0.05	0.25	0.05	0.08	0.05
45209	n-propylbenzene	59	0.05	7.96	0.23	0.94	1.55
45212	m-ethyltoluene	59	0.05	0.66	0.09	0.19	0.18
45213	p-ethyltoluene	59	0.05	1.45	0.28	0.34	0.32
45207	135-trimethylbenzene	59	0.05	0.75	0.09	0.18	0.17
45211	o-ethyltoluene	59	0.05	2.02	0.13	0.20	0.29
45208	124-trimethylbenzene	59	0.16	8.44	0.71	1.16	1.38
43238	n-decane	59	0.05	0.90	0.26	0.28	0.20
45225	123-trimethylbenzene	59	0.05	6.05	0.16	0.65	1.35
45218	m-diethylbenzene	59	0.05	0.76	0.05	0.12	0.15
45219	p-diethylbenzene	59	0.05	0.84	0.26	0.27	0.20
43954	n-undecane	59	0.05	13.41	0.12	0.36	1.73
43141	n-dodecane	59	0.05	2.19	0.21	0.34	0.38
43000	PAMHC	59	9	80	42	42.57	13.93
43102	TNMOC	59	13	156	68	71.47	26.27

**2002 AVERAGE CONCENTRATION OF DETECTABLE VOLATILE OZONE PRECURSORS
PHOTOCHEMICAL ASSESSMENT MONITORING STATION (PAMS) TYPE II - Math & Science Center**
Concentrations are in ppbC

Parameter	Compound Name	#N	Minimum	Maximum	Median	Average	StDev
43203	Ethylene	59	0.48	13.96	2.68	3.09	2.26
43206	Acetylene	59	0.83	14.91	2.67	3.74	3.02
43202	Ethane	59	2.57	37.64	6.75	10.32	8.65
43205	Propylene	59	0.43	4.50	0.96	1.39	1.07
43204	Propane	59	2.22	28.04	4.81	7.31	5.96
43214	Isobutane	59	0.55	8.91	1.57	2.16	1.78
43280	1-butene	59	0.29	4.20	0.89	1.39	0.98
43212	n-butane	59	0.98	25.70	5.22	5.80	4.15
43216	t-2-butene	59	0.05	4.26	0.82	0.44	0.21
43217	c-2-butene	59	0.05	2.92	0.37	0.35	0.27
43221	Isopentane	59	1.52	18.74	2.80	4.89	4.19
43224	1-pentene	59	0.18	4.16	0.70	0.78	0.56
43220	n-pentane	59	0.68	8.13	1.77	2.60	1.89
43243	Isoprene	59	0.13	11.80	2.39	2.09	1.25
43226	t-2-pentene	59	0.05	10.51	1.86	1.46	0.57
43227	c-2-pentene	59	0.13	2.74	0.35	0.35	0.26
43244	2,2-dimethylbutane	59	0.19	4.16	0.53	0.51	0.40
43242	Cyclopentane	59	0.05	1.90	0.35	0.44	0.35
43284	2,3-dimethylbutane	59	0.15	4.69	0.62	0.73	0.56
43285	2-methylpentane	59	0.39	6.44	0.98	1.58	1.37
43230	3-methylpentane	59	0.40	7.71	1.60	2.24	1.80
43245	2-methyl-1-pentene	59	0.05	4.56	0.80	0.75	0.42
43231	n-hexane	59	0.57	4.68	0.80	1.33	1.04
43262	Methylcyclopentane	59	0.30	2.54	0.50	0.75	0.54
43247	2,4-dimethylpentane	59	0.05	3.79	0.49	0.52	0.43
45201	Benzene	59	0.83	6.46	1.15	2.15	1.84
43248	Cyclohexane	59	0.05	3.50	0.56	0.50	0.35
43263	2-methylhexane	59	0.31	2.81	0.45	0.75	0.61
43291	2,3-dimethylpentane	59	0.18	4.60	0.58	0.59	0.48
43249	3-methylhexane	59	0.16	3.70	0.70	0.92	0.64
43250	224-trimethylpentane	59	0.25	5.41	0.90	1.46	1.18
43232	n-heptane	59	0.25	2.60	0.42	0.65	0.56
43261	Methylcyclohexane	59	0.05	2.75	0.38	0.43	0.34
43252	234-trimethylpentane	59	0.23	2.37	0.43	0.66	0.51
45202	Toluene	59	1.60	17.31	3.40	4.87	3.50
43960	2-methylheptane	59	0.05	2.21	0.31	0.34	0.26
43253	3-methylheptane	59	0.05	2.29	0.30	0.40	0.33
43233	n-octane	59	0.21	2.51	0.36	0.48	0.37
45203	Ethylbenzene	59	0.28	2.75	0.47	0.87	0.74
45109	m/p-xylene	59	0.87	7.04	1.18	2.23	1.80
45220	Styrene	59	0.15	3.49	0.48	0.56	0.47
45204	o-xylene	59	0.29	3.16	0.62	1.05	0.87
43235	n-nonane	59	0.18	2.41	0.39	0.48	0.35

**2002 AVERAGE CONCENTRATION OF DETECTABLE VOLATILE OZONE PRECURSORS
PHOTOCHEMICAL ASSESSMENT MONITORING STATION (PAMS) TYPE II - Math & Science Center**
(cont.)

Concentrations are in ppbC

Parameter	Compound Name	#N	Minimum	Maximum	Median	Average	StDev
45210	Isopropylbenzene	59	0.05	3.00	0.37	0.24	0.19
45209	n-propylbenzene	59	0.15	2.72	0.34	0.37	0.30
45212	m-ethyltoluene	59	0.25	2.62	0.49	0.78	0.59
45213	p-ethyltoluene	59	0.16	3.50	0.49	0.61	0.45
45207	135-trimethylbenzene	59	0.05	2.18	0.35	0.51	0.40
45211	o-ethyltoluene	59	0.13	2.85	0.37	0.44	0.33
45208	124-trimethylbenzene	59	0.33	5.88	0.97	1.46	1.15
43238	n-decane	59	0.05	4.63	0.66	0.67	0.47
45225	123-trimethylbenzene	59	0.12	3.70	0.80	0.59	0.30
45218	m-diethylbenzene	59	0.05	3.13	0.38	0.33	0.28
45219	p-diethylbenzene	59	0.10	2.27	0.33	0.38	0.28
43954	n-undecane	59	0.18	3.87	0.53	0.59	0.46
43141	n-dodecane	59	0.05	2.91	0.54	0.70	0.50
43000	PAMHC	59	32	257	45	84.01	68.14
43102	TNMOC	59	80	367	60	152.17	138.11

**2002 AVERAGE CONCENTRATION OF DETECTABLE VOLATILE OZONE PRECURSORS
PHOTOCHEMICAL ASSESSMENT MONITORING STATION (PAMS) Reduced TYPE IIA -**

Lee District Park

Concentrations are in ppbC

Parameter	Compound Name	#N	Minimum	Maximum	Median	Average	StDev
43203	Ethylene	60	0.43	13.15	1.61	2.19	1.93
43206	Acetylene	60	0.82	18.78	2.18	2.85	2.44
43202	Ethane	60	2.50	24.23	6.16	6.72	3.25
43205	Propylene	60	0.36	4.50	0.85	1.03	0.67
43204	Propane	60	1.78	14.11	4.75	5.02	2.31
43214	Isobutane	60	0.55	5.32	1.49	1.53	0.82
43280	1-butene	60	0.12	4.35	0.64	0.82	0.62
43212	n-butane	60	0.64	15.19	3.07	3.87	2.95
43216	t-2-butene	60	0.05	0.66	0.20	0.21	0.11
43217	c-2-butene	60	0.05	0.64	0.23	0.25	0.13
43221	Isopentane	60	0.76	8.90	2.87	3.17	1.46
43224	1-pentene	60	0.15	1.62	0.35	0.46	0.29
43220	n-pentane	60	0.48	6.21	1.47	1.97	1.31
43243	Isoprene	60	0.05	16.51	0.47	2.33	3.72
43226	t-2-pentene	60	0.05	0.68	0.25	0.25	0.14
43227	c-2-pentene	60	0.05	0.62	0.24	0.24	0.10
43244	2,2-dimethylbutane	60	0.05	0.79	0.35	0.37	0.13
43242	Cyclopentane	60	0.05	1.85	0.24	0.31	0.28
43284	2,3-dimethylbutane	60	0.05	1.08	0.44	0.49	0.22
43285	2-methylpentane	60	0.36	3.62	1.01	1.14	0.54
43230	3-methylpentane	60	0.26	7.68	0.84	1.42	1.43
43245	2-methyl-1-pentene	60	0.05	1.37	0.31	0.36	0.24
43231	n-hexane	60	0.36	2.79	0.84	0.93	0.46
43262	Methylcyclopentane	60	0.05	1.63	0.41	0.46	0.24
43247	2,4-dimethylpentane	60	0.05	0.65	0.28	0.31	0.13
45201	Benzene	60	0.77	6.66	1.64	1.87	0.96
43248	Cyclohexane	60	0.05	1.04	0.32	0.33	0.21
43263	2-methylhexane	60	0.05	1.40	0.44	0.48	0.22
43291	2,3-dimethylpentane	60	0.18	0.73	0.37	0.40	0.15
43249	3-methylhexane	60	0.20	2.82	0.47	0.61	0.42
43250	224-trimethylpentane	60	0.36	3.81	0.84	0.98	0.56
43232	n-heptane	60	0.20	1.32	0.44	0.49	0.25
43261	Methylcyclohexane	60	0.05	0.84	0.29	0.32	0.14
43252	234-trimethylpentane	60	0.05	1.39	0.35	0.41	0.21
45202	Toluene	60	1.27	12.24	2.81	3.23	1.84
43960	2-methylheptane	60	0.05	0.60	0.22	0.21	0.12
43253	3-methylheptane	60	0.05	0.54	0.24	0.25	0.12
43233	n-octane	60	0.05	0.72	0.28	0.31	0.15
45203	Ethylbenzene	60	0.28	2.27	0.65	0.73	0.39
45109	m/p-xylene	60	0.60	6.49	1.72	1.92	1.08

**2002 AVERAGE CONCENTRATION OF DETECTABLE VOLATILE OZONE PRECURSORS
PHOTOCHEMICAL ASSESSMENT MONITORING STATION (PAMS) Reduced TYPE IIA -**

Lee District Park (cont.)

Concentrations are in ppbC

Parameter	Compound Name	#N	Minimum	Maximum	Median	Average	StDev
45220	Styrene	60	0.16	0.96	0.43	0.48	0.20
45204	o-xylene	60	0.23	2.57	0.71	0.85	0.52
43235	n-nonane	60	0.05	1.02	0.27	0.31	0.16
45210	Isopropylbenzene	60	0.05	0.36	0.15	0.15	0.08
45209	n-propylbenzene	60	0.05	0.49	0.22	0.23	0.10
45212	m-ethyltoluene	60	0.18	1.83	0.44	0.51	0.28
45213	p-ethyltoluene	60	0.05	1.33	0.39	0.44	0.28
45207	135-trimethylbenzene	60	0.05	1.82	0.30	0.42	0.34
45211	o-ethyltoluene	60	0.05	0.76	0.27	0.29	0.14
45208	124-trimethylbenzene	60	0.26	2.74	0.74	0.91	0.53
43238	n-decane	60	0.05	1.20	0.36	0.42	0.24
45225	123-trimethylbenzene	60	0.05	1.50	0.25	0.38	0.34
45218	m-diethylbenzene	60	0.05	0.69	0.20	0.21	0.11
45219	p-diethylbenzene	60	0.05	0.91	0.27	0.29	0.17
43954	n-undecane	60	0.05	0.93	0.34	0.37	0.15
43141	n-dodecane	60	0.16	0.64	0.35	0.35	0.10
43102	PAMHC	60	51	260	91	98.97	35.13
43000	TNMOC	60	29	187	52	57.83	24.76

**2002 AVERAGE CONCENTRATION OF DETECTABLE VOLATILE OZONE PRECURSORS
PHOTOCHEMICAL ASSESSMENT MONITORING STATION ADDITIONAL VOC PAMS Sampling -
National Oceanic and Atmospheric Administration (NOAA) Site**

Concentrations are in ppbC

Parameter	Compound Name	#N	Minimum	Maximum	Median	Average	StDev
43203	Ethylene	53	0.66	12.65	1.83	2.72	2.27
43206	Acetylene	53	0.81	20.94	3.04	3.77	3.24
43202	Ethane	53	2.52	45.07	7.12	8.37	6.53
43205	Propylene	53	0.51	3.87	1.21	1.36	0.69
43204	Propane	53	2.10	14.54	4.72	5.66	2.75
43214	Isobutane	53	0.59	5.52	1.70	1.96	1.21
43280	1-butene	53	0.56	3.91	1.15	1.36	0.69
43212	n-butane	53	1.07	16.57	4.09	4.99	3.61
43216	t-2-butene	53	0.05	1.02	0.27	0.31	0.20
43217	c-2-butene	53	0.08	0.92	0.33	0.35	0.17
43221	Isopentane	53	1.50	11.19	3.95	4.70	2.34
43224	1-pentene	53	0.18	1.43	0.53	0.59	0.26
43220	n-pentane	53	0.78	5.54	1.97	2.24	1.11
43243	Isoprene	53	0.05	2.67	0.42	0.75	0.69
43226	t-2-pentene	53	0.18	0.93	0.40	0.41	0.17
43227	c-2-pentene	53	0.13	0.70	0.30	0.33	0.13
43244	2,2-dimethylbutane	53	0.05	1.13	0.41	0.47	0.20
43242	Cyclopentane	53	0.05	0.92	0.30	0.34	0.16
43284	2,3-dimethylbutane	53	0.26	1.25	0.55	0.62	0.25
43285	2-methylpentane	53	0.58	3.85	1.28	1.51	0.71
43230	3-methylpentane	53	0.41	6.03	1.19	1.89	1.41
43245	2-methyl-1-pentene	53	0.12	2.11	0.53	0.61	0.43
43231	n-hexane	53	0.40	3.41	1.21	1.42	0.69
43262	Methylcyclopentane	53	0.28	1.87	0.60	0.70	0.32
43247	2,4-dimethylpentane	53	0.16	0.98	0.38	0.42	0.18
45201	Benzene	53	0.54	5.66	1.88	2.07	1.06
43248	Cyclohexane	53	0.11	0.75	0.30	0.35	0.14
43263	2-methylhexane	53	0.23	1.64	0.60	0.68	0.30
43291	2,3-dimethylpentane	53	0.19	0.96	0.51	0.50	0.17
43249	3-methylhexane	53	0.27	3.92	0.65	0.82	0.58
43250	224-trimethylpentane	53	0.34	3.36	1.01	1.25	0.69
43232	n-heptane	53	0.19	1.24	0.49	0.55	0.23
43261	Methylcyclohexane	53	0.05	0.87	0.35	0.38	0.14
43252	234-trimethylpentane	53	0.18	1.21	0.48	0.53	0.25
45202	Toluene	53	1.17	10.29	3.20	3.63	1.86
43960	2-methylheptane	53	0.05	0.69	0.30	0.31	0.12
43253	3-methylheptane	53	0.16	0.56	0.33	0.34	0.10
43233	n-octane	53	0.18	1.08	0.38	0.41	0.17
45203	Ethylbenzene	53	0.36	3.03	0.76	0.87	0.46
45109	m/p-xylene	53	0.92	6.06	2.19	2.42	1.08
45220	Styrene	53	0.18	1.63	0.47	0.51	0.28
45204	o-xylene	53	0.36	2.45	0.88	1.01	0.49

2002 AVERAGE CONCENTRATION OF DETECTABLE VOLATILE OZONE PRECURSORS
PHOTOCHEMICAL ASSESSMENT MONITORING STATION ADDITIONAL VOC PAMS Sampling -
National Oceanic and Atmospheric Administration (NOAA) Site (cont.)

Concentrations are in ppbC

Parameter	Compound Name	#N	Minimum	Maximum	Median	Average	StDev
43235	n-nonane	53	0.19	1.32	0.41	0.45	0.21
45210	Isopropylbenzene	53	0.05	0.54	0.21	0.21	0.10
45209	n-propylbenzene	53	0.12	0.76	0.33	0.35	0.14
45212	m-ethyltoluene	53	0.32	2.12	0.73	0.85	0.40
45213	p-ethyltoluene	53	0.24	1.30	0.47	0.53	0.25
45207	135-trimethylbenzene	53	0.14	1.27	0.49	0.59	0.32
45211	o-ethyltoluene	53	0.13	0.84	0.35	0.39	0.16
45208	124-trimethylbenzene	53	0.49	3.98	1.12	1.40	0.76
43238	n-decane	53	0.20	1.39	0.54	0.57	0.26
45225	123-trimethylbenzene	53	0.10	2.88	0.35	0.64	0.68
45218	m-diethylbenzene	53	0.11	1.03	0.25	0.30	0.16
45219	p-diethylbenzene	53	0.12	1.30	0.36	0.40	0.21
43954	n-undecane	53	0.22	0.83	0.49	0.49	0.15
43141	n-dodecane	53	0.05	0.83	0.42	0.43	0.15
43102	PAMHC	53	85	247	124	135.64	39.23
43000	TNMOC	53	38	175	64	72.13	31.56

3 Hour Carbonyl Sampling - Math & Science Center - 2002 Summary Statistical Analysis
 Unit of Concentration: ppbV

Time	Parameter	Compound Name	#N	Min.	Max.	Media n	Average	StDev
9:00 AM - 12:00 PM	43503	Acetaldehyde	27	0.58	2.20	1.08	1.18	0.39
	43551	Acetone	27	1.09	5.77	2.92	3.09	0.94
	43505	Acrolein	27	0.03	0.04	0.03	0.03	0.01
	43502	Formaldehyde	27	1.50	12.79	5.77	6.24	2.98
	43552	Methyl Ethyl Ketone	27	0.04	1.67	0.41	0.48	0.31
	43560	Methyl Isobutyl Ketone	27	0.03	0.04	0.04	0.04	0.01
	43504	Propionaldehyde	27	0.02	0.21	0.02	0.03	0.04
12:00 PM - 3:00 PM	43503	Acetaldehyde	27	0.54	1.74	1.07	1.12	0.30
	43551	Acetone	27	1.13	5.14	3.21	3.32	0.86
	43505	Acrolein	27	0.03	0.04	0.03	0.03	0.01
	43502	Formaldehyde	27	1.75	11.14	6.80	6.65	2.17
	43552	Methyl Ethyl Ketone	27	0.04	1.98	0.41	0.46	0.35
	43560	Methyl Isobutyl Ketone	27	0.03	0.04	0.04	0.04	0.01
	43504	Propionaldehyde	27	0.02	0.03	0.02	0.02	0.00
3:00 PM - 6:00 PM	43503	Acetaldehyde	27	0.59	1.70	1.13	1.10	0.26
	43551	Acetone	27	1.27	5.20	3.42	3.31	0.80
	43505	Acrolein	27	0.03	0.04	0.03	0.03	0.01
	43502	Formaldehyde	27	2.24	11.28	6.42	6.73	2.26
	43552	Methyl Ethyl Ketone	27	0.17	0.83	0.37	0.41	0.17
	43560	Methyl Isobutyl Ketone	27	0.03	0.04	0.04	0.04	0.01
	43504	Propionaldehyde	27	0.02	0.03	0.02	0.02	0.00
6:00 PM - 9:00 PM	43503	Acetaldehyde	27	0.59	2.27	1.13	1.24	0.43
	43551	Acetone	27	1.33	6.03	3.14	3.24	0.93
	43505	Acrolein	27	0.03	0.16	0.03	0.04	0.02
	43502	Formaldehyde	27	1.79	13.31	5.87	6.10	2.62
	43552	Methyl Ethyl Ketone	27	0.04	2.11	0.42	0.47	0.38
	43560	Methyl Isobutyl Ketone	27	0.03	0.20	0.04	0.04	0.03
	43504	Propionaldehyde	27	0.02	0.03	0.02	0.02	0.00

Air Toxics Monitoring Network Stations



In 2002, the Air Quality Monitoring (AQM) program of the Department of Environmental Quality operated three Air Toxics Monitoring Network (ATMN) stations. These sites are located at the Math and Science Center in Henrico County, NOAA property in the city of Norfolk, and Lee District Park in Fairfax County. Sampling at these sites consisted of VOC, Carbonyl ,and Total Suspended Particulate (TSP) collection. Sampling frequency consisted of one 24-hour sample collected every 6th day. Data from these sites will be used to characterize air toxics concentrations in the respective urban areas.

AQM used the manual method for collecting ambient air samples for VOC analysis. Whole air samples were collected using evacuated Summa^T canisters and Xontech air samplers. Each sample was analyzed by the Maryland Department of the Environment, Air and Radiation Management Administration, using a Gas Chromatograph equipped with a Mass Selective Detector.

Total suspended particulates were collected on quartz filters used in high volume samplers. These filters will be analyzed for various heavy metals. We have presented the gravimetric data on the collected samples.

Carbonyls were collected on DNPH (2,4-Dinitrophenylhydrazine) treated sorbent tubes using ATEC^t cartridge samplers. Analyses were performed by the Philadelphia Health Department using a Liquid Chromatographic procedure.

Detailed data collected at these sites in 2002 are available upon written request to the Virginia Department of Environmental Quality, Office of Air Quality Monitoring.

Detectable VOC In 24-Hour Canister Samples
GC/MSD - Math & Science Center - Henrico County, VA
January 1 to December 31, 2002 - Concentrations are in ppbV

Parameter	Compound Name	#N	Min.	Max.	Median	Average	StDev
43823	Dichlorodifluoromethane	59	0.46	0.66	0.55	0.56	0.05
43801	Chloromethane	59	0.44	0.72	0.60	0.60	0.05
43208	1,2-Dichloro-1,1,2,2-tetra	59	0.01	0.10	0.02	0.02	0.01
43860	Chloroethene	59	0.01	0.09	0.03	0.03	0.01
43218	1,3-Butadiene	59	0.01	0.33	0.05	0.07	0.07
43819	Bromomethane	59	0.01	0.10	0.01	0.02	0.02
43812	Chloroethane	59	0.01	0.10	0.03	0.03	0.01
43811	Trichlorofluoromethane	59	0.18	0.41	0.27	0.28	0.04
43826	1,1-Dichloroethene	59	0.01	0.08	0.04	0.03	0.01
43802	Methylene Chloride	59	0.04	0.67	0.36	0.37	0.09
43207	1,1,2-Trichloro-1,2,2-trif	59	0.06	0.16	0.08	0.08	0.01
43813	1,1-Dichloroethane	59	0.01	0.08	0.02	0.02	0.01
43839	Cis-1,2-Dichloroethene	59	0.01	0.07	0.03	0.03	0.01
43803	Chloroform	59	0.01	0.10	0.02	0.02	0.01
43815	1,2-Dichloroethane	59	0.01	0.08	0.02	0.02	0.01
43814	1,1,1-Trichloroethane	59	0.02	0.11	0.03	0.03	0.01
45201	Benzene	59	0.09	0.78	0.21	0.25	0.15
43804	Carbon tetrachloride	59	0.04	0.15	0.08	0.08	0.02
43829	1,2-Dichloropropane	59	0.01	0.08	0.02	0.02	0.01
43824	Trichloroethene	59	0.01	0.08	0.01	0.02	0.01
43831	Cis-1,3-Dichloropropene	59	0.01	0.07	0.03	0.02	0.01
43830	Trans-1,3-Dichloropropen	59	0.01	0.05	0.03	0.03	0.00
43820	1,1,2-Trichloroethane	59	0.01	0.07	0.02	0.02	0.01
45202	Toluene	59	0.13	1.93	0.33	0.47	0.39
43843	1,2-Dibromoethane	59	0.01	0.06	0.03	0.03	0.00
43817	Tetrachloroethylene	59	0.01	0.12	0.02	0.03	0.02
45801	Chlorobenzene	59	0.01	0.08	0.02	0.02	0.01
45203	Ethylbenzene	59	0.02	0.18	0.04	0.05	0.03
45109	m & p- Xylene	59	0.04	0.54	0.10	0.14	0.11
45220	Styrene	59	0.01	0.07	0.02	0.02	0.01
43818	1,1,2,2-Tetrachloroethane	59	0.01	0.10	0.02	0.02	0.01
45204	o-Xylene	59	0.02	0.20	0.04	0.05	0.04
45213	1-Ethyl-4-Methylbenzene	59	0.01	0.08	0.02	0.02	0.02
45207	1,3,5-Trimethylbenzene	59	0.01	0.08	0.02	0.02	0.02
45208	1,2,4-Trimethylbenzene	59	0.01	0.27	0.04	0.05	0.04
45809	Benzyl Chloride	59	0.01	0.03	0.03	0.03	0.00
45806	1,3-dichlorobenzene	59	0.01	0.05	0.02	0.02	0.00
45807	1,4-Dichlorobenzene	59	0.01	0.07	0.01	0.02	0.01
45805	1,2-Dichlorobenzene	59	0.01	0.06	0.02	0.02	0.01
45810	1,2,4-Trichlorobenzene	59	0.01	0.15	0.15	0.14	0.03
43844	Hexachloro-1,3-Butadiene	59	0.01	0.13	0.13	0.12	0.03

Detectable VOC In 24-Hour Canister Samples
GC/MSD - Lee District Park - Fairfax County, VA
January 1 to December 31, 2002 - Concentrations are in ppbV

Parameter	Compound Name	#N	Min.	Max.	Median	Average	StDev
43823	Dichlorodifluoromethane	61	0.44	0.77	0.57	0.58	0.06
43801	Chloromethane	61	0.44	1.20	0.61	0.62	0.10
43208	1,2-Dichloro-1,1,2,2,tetra	61	0.01	0.16	0.02	0.03	0.03
43860	Chloroethene	61	0.01	0.13	0.03	0.03	0.02
43218	1,3-Butadiene	61	0.01	0.25	0.04	0.06	0.05
43819	Bromomethane	61	0.01	0.16	0.01	0.02	0.03
43812	Chloroethane	61	0.01	0.14	0.03	0.03	0.02
43811	Trichlorofluoromethane	61	0.21	0.41	0.28	0.29	0.03
43826	1,1-Dichloroethene	61	0.01	0.13	0.04	0.04	0.02
43802	Methylene Chloride	61	0.07	0.32	0.16	0.16	0.05
43207	1,1,2-Trichloro-1,2,2-trif	61	0.06	0.22	0.08	0.09	0.02
43813	1,1-Dichloroethane	61	0.01	0.14	0.02	0.03	0.02
43839	Cis-1,2-Dichloroethene	61	0.01	0.12	0.02	0.03	0.01
43803	Chloroform	61	0.01	0.14	0.03	0.03	0.02
43815	1,2-Dichloroethane	61	0.01	0.13	0.02	0.02	0.02
43814	1,1,1-Trichloroethane	61	0.01	0.16	0.03	0.04	0.02
45201	Benzene	61	0.09	0.98	0.20	0.23	0.14
43804	Carbon tetrachloride	61	0.03	0.17	0.09	0.09	0.02
43829	1,2-Dichloropropane	61	0.01	0.12	0.02	0.02	0.02
43824	Trichloroethene	61	0.01	0.12	0.02	0.03	0.02
43831	Cis-1,3-Dichloropropene	61	0.01	0.10	0.02	0.03	0.01
43830	Trans-1,3-Dichloropropen	61	0.01	0.08	0.03	0.03	0.01
43820	1,1,2-Trichloroethane	61	0.01	0.11	0.02	0.02	0.02
45202	Toluene	61	0.10	1.54	0.24	0.29	0.22
43843	1,2-Dibromoethane	61	0.01	0.09	0.03	0.03	0.01
43817	Tetrachloroethylene	61	0.01	0.24	0.04	0.05	0.04
45801	Chlorobenzene	61	0.01	0.11	0.02	0.02	0.02
45203	Ethylbenzene	61	0.01	0.18	0.04	0.05	0.03
45109	m & p- Xylene	61	0.02	0.88	0.10	0.14	0.14
45220	Styrene	61	0.01	0.10	0.03	0.03	0.02
43818	1,1,2,2-Tetrachloroethane	61	0.01	0.11	0.02	0.02	0.02
45204	o-Xylene	61	0.01	0.20	0.04	0.05	0.04
45213	1-Ethyl-4-Methylbenzene	61	0.01	0.10	0.02	0.02	0.02
45207	1,3,5-Trimethylbenzene	61	0.01	0.11	0.02	0.02	0.02
45208	1,2,4-Trimethylbenzene	61	0.01	0.22	0.03	0.04	0.04
45809	Benzyl Chloride	61	0.01	0.04	0.03	0.03	0.01
45806	1,3-dichlorobenzene	61	0.01	0.09	0.02	0.02	0.01
45807	1,4-Dichlorobenzene	61	0.01	0.09	0.02	0.02	0.02
45805	1,2-Dichlorobenzene	61	0.01	0.10	0.02	0.02	0.01
45810	1,2,4-Trichlorobenzene	61	0.01	0.15	0.15	0.13	0.04
43844	Hexachloro-1,3-Butadiene	61	0.01	0.13	0.13	0.11	0.04

Detectable VOC In 24-Hour Canister Samples
GC/MSD - NOAA Site - Norfolk, VA
January 1 to December 31, 2002 - Concentrations are in ppbV

Parameter	Compound Name	#N	Min.	Max.	Median	Average	StDev
43823	Dichlorodifluoromethane	53	0.44	0.69	0.57	0.57	0.04
43801	Chloromethane	53	0.51	0.76	0.63	0.63	0.05
43208	1,2-Dichloro-1,1,2,2,tetra	53	0.01	0.05	0.02	0.02	0.01
43860	Chloroethene	53	0.01	0.50	0.03	0.04	0.06
43218	1,3-Butadiene	53	0.01	0.41	0.06	0.08	0.07
43819	Bromomethane	53	0.01	0.03	0.01	0.02	0.01
43812	Chloroethane	53	0.01	0.03	0.03	0.03	0.01
43811	Trichlorofluoromethane	53	0.19	0.48	0.27	0.27	0.04
43826	1,1-Dichloroethene	53	0.01	0.04	0.04	0.03	0.01
43802	Methylene Chloride	53	0.07	0.37	0.15	0.16	0.05
43207	1,1,2-Trichloro-1,2,2-trif	53	0.06	0.12	0.08	0.08	0.01
43813	1,1-Dichloroethane	53	0.01	0.02	0.02	0.02	0.00
43839	Cis-1,2-Dichloroethene	53	0.03	0.03	0.03	0.03	0.00
43803	Chloroform	53	0.01	0.04	0.02	0.02	0.01
43815	1,2-Dichloroethane	53	0.01	0.02	0.02	0.02	0.00
43814	1,1,1-Trichloroethane	53	0.01	0.07	0.03	0.03	0.01
45201	Benzene	53	0.07	0.85	0.23	0.26	0.16
43804	Carbon tetrachloride	53	0.06	0.10	0.08	0.08	0.01
43829	1,2-Dichloropropane	53	0.01	0.02	0.02	0.02	0.00
43824	Trichloroethene	53	0.01	0.10	0.01	0.02	0.01
43831	Cis-1,3-Dichloro-Propene	53	0.01	0.03	0.03	0.02	0.00
43830	Trans-1,3-Dichloro-Prope	53	0.03	0.03	0.03	0.03	0.00
43820	1,1,2-Trichloroethane	53	0.01	0.02	0.02	0.02	0.00
45202	Toluene	53	0.11	1.29	0.31	0.36	0.25
43843	1,2-Dibromoethane	53	0.03	0.03	0.03	0.03	0.00
43817	Tetrachloroethylene	53	0.01	0.20	0.02	0.03	0.03
45801	Chlorobenzene	53	0.01	0.02	0.02	0.02	0.00
45203	Ethylbenzene	53	0.02	0.17	0.05	0.06	0.03
45109	m & p- Xylene	53	0.03	1.06	0.14	0.19	0.18
45220	Styrene	53	0.01	0.12	0.01	0.02	0.02
43818	1,1,2,2-Tetrachloroethane	53	0.01	0.03	0.02	0.02	0.00
45204	o-Xylene	53	0.02	0.19	0.05	0.06	0.04
45213	1-Ethyl-4-Methylbenzene	53	0.01	0.06	0.02	0.03	0.02
45207	1,3,5-Trimethylbenzene	53	0.01	0.06	0.02	0.02	0.01
45208	1,2,4-Trimethylbenzene	53	0.02	0.23	0.05	0.07	0.05
45809	Benzyl Chloride	53	0.01	0.03	0.03	0.03	0.00
45806	1,3-dichlorobenzene	53	0.02	0.02	0.02	0.02	0.00
45807	1,4-Dichlorobenzene	53	0.01	0.05	0.01	0.01	0.01
45805	1,2-Dichlorobenzene	53	0.01	0.02	0.02	0.02	0.00
45810	1,2,4-Trichlorobenzene	53	0.15	0.15	0.15	0.15	0.00
43844	Hexachloro-1,3-Butadiene	53	0.01	0.13	0.13	0.12	0.03

24 Hour Carbonyl Sampling 2002 Summary Statistical Analysis

Unit of Concentration: ppbV

Site	Parameter	Compound Name	#N	Min	Max	Median	Average	StDev
Math & Science Center	43503	Acetaldehyde	43	0.32	1.73	0.81	0.83	0.29
	43551	Acetone	43	0.41	4.99	1.32	1.33	0.75
	43505	Acrolein	43	0.00	0.06	0.01	0.01	0.01
	43502	Formaldehyde	43	0.62	8.76	1.91	2.96	2.16
	43552	Methyl Ethyl Ketone	43	0.05	0.62	0.20	0.22	0.12
	43560	Methyl Isobutyl Ketone	43	0.00	0.13	0.01	0.02	0.02
	43504	Propionaldehyde	43	0.00	0.26	0.01	0.03	0.06
Lee Park	43503	Acetaldehyde	59	0.15	1.80	0.70	0.75	0.32
	43551	Acetone	59	0.25	3.04	1.02	1.03	0.48
	43505	Acrolein	59	0.00	0.08	0.01	0.01	0.01
	43502	Formaldehyde	59	0.12	7.54	1.72	2.18	1.64
	43552	Methyl Ethyl Ketone	59	0.04	0.50	0.17	0.18	0.09
	43560	Methyl Isobutyl Ketone	59	0.00	0.10	0.01	0.01	0.01
	43504	Propionaldehyde	59	0.00	0.22	0.01	0.03	0.06
NOAA	43503	Acetaldehyde	43	0.43	5.44	0.79	1.13	1.15
	43551	Acetone	43	0.20	1.97	0.91	0.93	0.45
	43505	Acrolein	43	0.00	0.86	0.01	0.09	0.22
	43502	Formaldehyde	43	0.98	35.87	2.31	5.33	8.94
	43552	Methyl Ethyl Ketone	43	0.06	0.69	0.18	0.23	0.15
	43560	Methyl Isobutyl Ketone	43	0.00	0.06	0.01	0.01	0.01
	43504	Propionaldehyde	43	0.00	0.64	0.03	0.10	0.16

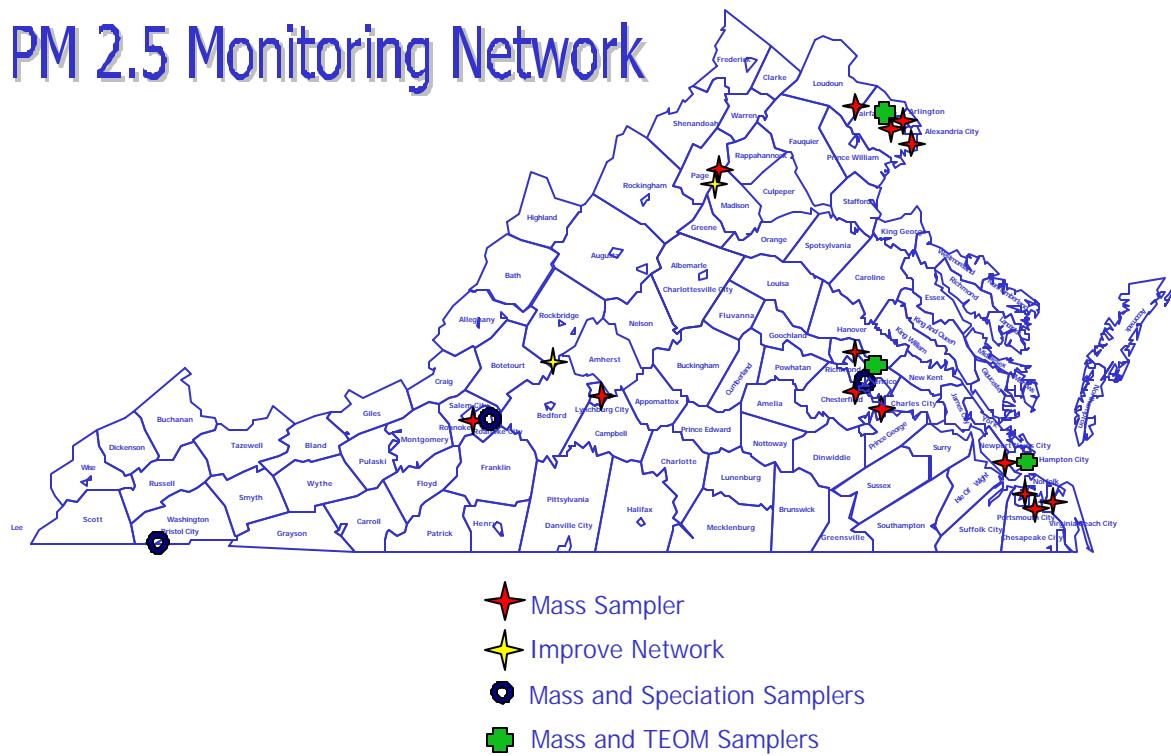
Total Suspended Particulate 2002 Summary Statistical Analysis

Unit of Concentration: ug/m³

Site	#N	Min	Max	Median	AVG	StDev
Math & Science Center	55	5.92	84.47	27.67	32.94	15.59
Lee District Park	56	6.02	102.75	22.75	29.08	17.90
NOAA Site	53	11.25	78.99	35.40	35.75	14.68

Metal analysis has not been completed on the 2002 TSP samples due to laboratory instrument problems.

PM 2.5 Monitoring Network



PM_{2.5} is particulate matter (PM) that is less than or equal to 2.5 micrometers in aerometric diameter. Particles originate from a variety of anthropogenic stationary and mobile sources as well as from natural sources. Particles may be emitted directly or formed in the atmosphere by transformation of gaseous emissions such as sulfur oxides (SO_x), nitrogen oxides (NO_x), and Volatile Organic Compounds (VOC). The chemical and physical properties of particulate matter vary greatly with time, region, meteorology, and source category, thus complicating the assessment of health and welfare effects.

PM_{2.5} standards were implemented by EPA to "provide increased protection against a wide range of PM-related health effects". These health effects include but are not limited to "premature mortality, decreased lung function, increased respiratory symptoms and disease such as asthma, and alterations in lung tissue". The standards are "requisite to protect the public welfare from any known or anticipated adverse effects associated with the presence of the pollutant in the ambient air. These effects include but are not limited to effects on soils, water, crops, vegetation, manmade materials, animals, wildlife, weather, visibility, and climate, damage and deterioration of property, and hazards to transportation, as well as effects on economic values and on personal comfort and well being".

The Virginia DEQ PM_{2.5} monitoring network utilizes three different types of particulate monitoring samplers:

PM_{2.5} 24-hour Mass Sampler: This Federal Reference Method (FRM) sampler collects particulate matter on a stretched Teflon filter media. Three samplers (Richmond, Chesapeake, and Fairfax) collect 24-hour samples every day. The rest of these samplers collect 24-hour samples on a one-in-three-day schedule. Filters are retrieved from the field and shipped via courier to the Virginia Division of Consolidated Laboratories in Richmond. Once at the laboratory, the filters are equilibrated for a minimum of 24 hours prior to the final weighing.

PM_{2.5} 24-hour Speciation Sampler: This sampler collects particulate matter on nylon, Teflon, and quartz filters, in three sampling modules. These modules are picked up by the operator after the sampling period and shipped refrigerated to the EPA Contract Laboratory. The lab analyzes the filters for mass loading, trace elements (such as: aluminum, antimony, arsenic, barium, bromine, zirconium), cations (ammonium, potassium, sodium), anions (nitrate, sulfate), and carbons (carbonate carbon, elemental carbon, organic carbon). The Richmond speciation monitor operates on a one-in-three-day sampling schedule. The Roanoke and Bristol speciation monitors operate on a one-in-six day sampling schedule.

PM_{2.5} Continuous Monitor: This sampler collects particulate samples on a continuous basis, and data are compiled into hourly averages. The sampler utilizes a Tapered Element Oscillating Microbalance (TEOM) in the sampling design. TEOM samplers are operated by Virginia DEQ in Hampton and Henrico County, and by the Fairfax County Health Department in Fairfax County.

In addition to the PM_{2.5} network operated by the DEQ, the National Park Service and the USDA Forest Service operated PM_{2.5} samplers at Big Meadows and in Rockbridge Co. as part of the IMPROVE (Interagency Monitoring of Protected Visual Environments) network. This network employs different sampling methods than those used by the DEQ. Data for the IMPROVE network can be found on the internet at <http://vista.cira.colostate.edu/improve>.

VIRGINIA 2002
PM2.5 PARTICULATE MATTER SUMMARY BY REGION
METHOD CODE 118 - GRAVIMETRIC, R & P MODEL 2025 SEQUENTIAL
Micrograms Per Cubic Meter (ug/m³)

LOCATION/ STATION NO.	24-HOUR SAMPLING				QUARTERLY ARITHMETIC MEAN				ANNUAL ARITH. MEAN	
	NO. OBS.	MAX	2ND MAX	98 th PERCENTILE VALUE	I	II	III	IV		
SOUTHWEST REGION										
BRISTOL Highland View Elementary School	101-E	113	37.3	36.7	33.3	11.5	14.8	17.9	12.1	14.1
VALLEY REGION										
LURAY Luray Caverns Airport	29-D	118	40.6	36.0	35.3	10.1	13.4	18.3	11.0	13.2
WEST CENTRAL REGION										
ROANOKE Raleigh Court Library	109-L	119	39.5	35.5	33.5	12.8	13.4	19.7	11.6	14.4
SALEM Market Street Fire Station	110-B	119	40.7	37.0	36.0	12.2	14.5	21.7	11.9	15.1
LYNCHBURG Central Va. Community College	155-P	107	35.4	33.4	32.1	10.7	13.5	19.6	11.3	13.8
PIEDMONT REGION										
CHESTERFIELD CO. Bensley Armory	71-D	113	33.0	32.7	30.2	10.4	13.5	16.9	13.2	13.5
HENRICO CO. Math & Science Center	72-M	113	37.5	32.1	28.9	12.0	13.6	17.2	12.1	13.7

VIRGINIA 2002
PM2.5 PARTICULATE MATTER SUMMARY BY REGION
METHOD CODE 118 - GRAVIMETRIC, R & P MODEL 2025 SEQUENTIAL
Micrograms Per Cubic Meter (ug/m³)

LOCATION/ STATION NO.	24-HOUR SAMPLING				QUARTERLY ARITHMETIC MEAN				ANNUAL ARITH. MEAN	
	NO. OBS.	MAX	2ND MAX	98 TH PERCENTILE VALUE	I	II	III	IV		
PIEDMONT REGION (cont.)										
HENRICO CO. Piedmont Regional Office	72-N	118	38.8	31.6	30.0	10.0	13.3	17.4	11.7	13.1
CHARLES CITY CO. Route #608	75-B	114	34.7	29.4	28.7	10.9	12.5	16.5	10.2	12.5
RICHMOND Air Monitoring Office	158-S	352	50.5	46.2	32.5	12.3	12.1	17.6	12.0	13.5
TIDEWATER REGION										
CHESAPEAKE Oscar Smith Stadium	176-R	333	49.4	39.2	29.8	10.6	12.1	13.7	11.2	11.9
HAMPTON Va. School for the Deaf & Blind	179-C	114	32.9	27.3	22.5	10.4	11.0	13.6	11.6	11.7
NEWPORT NEWS Pump Station #103	180-O	114	33.7	33.5	27.8	9.8	11.8	14.6	11.4	11.9
NORFOLK NOAA Facility	181-A1	118	50.8	34.2	33.6	10.7	11.9	16.6	11.4	12.6
VA. BEACH Tidewater Regional Office	184-J	113	50.2	38.0	36.5	10.8	11.2	15.8	12.1	12.4

VIRGINIA 2002
PM2.5 PARTICULATE MATTER SUMMARY BY REGION
METHOD CODE 118 - GRAVIMETRIC, R & P MODEL 2025 SEQUENTIAL
Micrograms Per Cubic Meter (ug/m³)

REGION/LOCATION STATION NO.	24-HOUR SAMPLING				QUARTERLY ARITHMETIC MEAN				ANNUAL ARITH. MEAN	
	NO. OBS.	MAX	2ND MAX	98 TH PERCENTILE VALUE	I	II	III	IV		
NORTHERN REGION										
LOUDOUN CO. Broad Run High School	38-I	117	45.3	38.3	32.3	10.4	14.3	18.4	11.1	13.5
FAIRFAX CO. Lee District Park	46-B9	349	48.9	48.8	37.9	10.3	13.2	17.7	11.7	13.2
ARLINGTON CO. Aurora Hills Visitors Center	47-T	120	52.2	39.3	37.1	11.7	15.3	19.2	13.7	15.0
FAIRFAX CO. McLean Governmental Center	L-46-A8	113	48.9	35.1	34.7	11.5	14.3	19.1	12.0	14.2
FAIRFAX CO. Mason Governmental Center	L-46-C1*	85	48.0	35.0	35.0	NA	15.1	17.8	11.8	NA

* New Station

VIRGINIA 2002
PM2.5 PARTICULATE MATTER CONCENTRATIONS IN RANGES
METHOD 118 - GRAVIMETRIC, R & P MODEL 2025 SEQUENTIAL
Micrograms Per Cubic Meter (ug/m³)
Sampling Schedule Every Three Days

LOCATION/ STATION NO.	NO. 24-HR. OBS.	NO. OF 24-HOUR CONCENTRATIONS IN RANGES						
		0 to 15	16 to 30	31 to 50	51 to 70	71 to 90	91 to 110	>110
SOUTHWEST REGION								
BRISTOL Highland View Elementary School	101-E	113	73	36	4	0	0	0
VALLEY REGION								
LURAY Luray Caverns Airport	29-D	118	84	29	5	0	0	0
WEST CENTRAL REGION								
ROANOKE Raleigh Court Library	109-L	119	73	40	6	0	0	0
SALEM Market Street Fire Station	110-B	119	76	36	7	0	0	0
LYNCHBURG Central Va. Community College	155-P	107	72	31	4	0	0	0

VIRGINIA 2002
PM2.5 PARTICULATE MATTER CONCENTRATIONS IN RANGES
METHOD 118 - GRAVIMETRIC, R & P MODEL 2025 SEQUENTIAL
Micrograms Per Cubic Meter (ug/m³)
Sampling Schedule Every Three Days

LOCATION/ STATION NO.	NO. 24-HR. OBS.	NO. OF 24-HOUR CONCENTRATIONS IN RANGES						
		0 to 15	16 to 30	31 to 50	51 to 70	71 to 90	91 to 110	>110
PIEDMONT REGION								
CHESTERFIELD CO. Bensley Armory	71-D	113	75	36	2	0	0	0
HENRICO CO. Math & Science Center	72-M	113	75	36	2	0	0	0
HENRICO CO. Piedmont Regional Office	72-N	118	84	32	2	0	0	0
CHARLES CITY CO. Route #608	75-B	114	86	27	1	0	0	0
RICHMOND Air Monitoring Office	158-S*	352	247	95	9	1	0	0
TIDEWATER REGION								
CHESAPEAKE Oscar Smith Middle School	176-R*	333	263	66	4	0	0	0
HAMPTON Va. School for the Deaf & Blind	179-C	114	91	22	1	0	0	0
NEWPORT NEWS Pump Station #103	180-O	114	90	22	2	0	0	0

* These samplers run daily.

VIRGINIA 2002
PM2.5 PARTICULATE MATTER CONCENTRATIONS IN RANGES
METHOD 118 - GRAVIMETRIC, R & P MODEL 2025 SEQUENTIAL
Micrograms Per Cubic Meter (ug/m³)
Sampling Schedule Every Three Days

LOCATION/ STATION NO.	NO. 24-HR. OBS.	NO. OF 24-HOUR CONCENTRATIONS IN RANGES						
		0 to 15	16 to 30	31 to 50	51 to 70	71 to 90	91 to 110	>110
TIDEWATER REGION (continued)								
NORFOLK NOAA Facility	181-A1	118	88	27	2	1	0	0
VIRGINIA BEACH Tidewater Regional Office	184-J	113	86	24	3	0	0	0
NORTHERN REGION								
LOUDOUN Broad Run High School	38-I	117	82	30	5	0	0	0
FAIRFAX CO. Lee District Park	46-B9*	349	255	79	15	0	0	0
ARLINGTON CO. Aurora Hills Visitors Center	47-T	120	76	34	9	1	0	0

* This sampler runs daily.

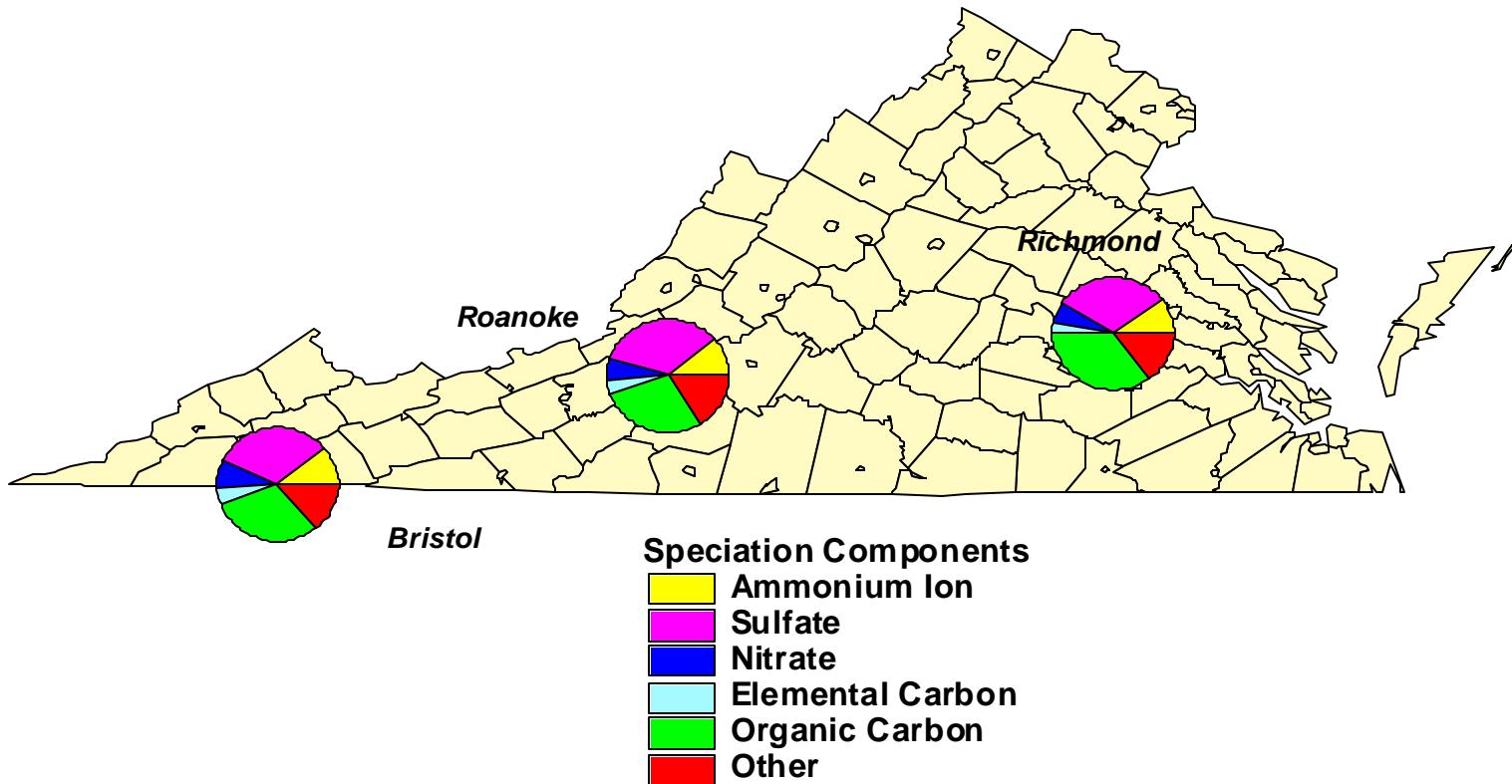
VIRGINIA 2002
PM2.5 PARTICULATE MATTER CONCENTRATIONS IN RANGES
METHOD 118 - GRAVIMETRIC, R & P MODEL 2025 SEQUENTIAL
Micrograms Per Cubic Meter (ug/m³)
Sampling Schedule Every Three Days

LOCATION/ STATION NO.	NO. 24-HR. OBS.	NO. OF 24-HOUR CONCENTRATIONS IN RANGES						
		0 to 15	16 to 30	31 to 50	51 to 70	71 to 90	91 to 110	>110
FAIRFAX COUNTY								
FAIRFAX CO. McLean Governmental Center	L-46-A8	113	74	33	6	0	0	0
FAIRFAX CO. Mason Governmental Center	L-46-C1**	85	55	25	5	0	0	0

** New Station

Virginia PM_{2.5} Speciation Sites 2002 Annual Averages

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Representative Sample Analysis of PM_{2.5} Speciation

LOCATION	Roanoke	9/23/2002	AIRS_CODE	517700014	POC 5
SAMPLER TYPE	SASS Mini-Trends Configuration				
FIELD CUSTODY NO	Q39375J	ROUTINE			
CHANNEL	1	SAMPLE VOLUME	9.591		
Sample Handling Validation Checks Performed		Level 0:	T	Level 1:	T
Event Flags: DST	Flow Flags:				
Field Sampling Data					
		Value			
2311	Average flow	6.710			
2312	Avg ambient temp	19.00			
2313	Avg BP	734.0			
2314	Delta T Flag				
2315	End date	9/24/2002			
2316	End time	12:00 AM			
2317	Max ambient temp	25.00			
2318	Max BP	737.0			
2319	Min ambient temp	14.00			
2320	Min BP	731.0			
2321	Retrieval date	9/24/2002			
2322	Retrieval time	01:25 PM			
2323	Run Time	23.95			
2324	Run Time Flag				
2325	Sample volume	9.591			
2326	Start date	9/23/2002			
2327	Start time	12:00 AM			

Representative Sample Analysis (Cont.)

Laboratory Analysis Data									
Teflon Filter		I4888A							
Shipping Flags:									
Module Disassembly Flags:									
		Analyte Mass (ug)	Conc (ug/m3)	Lab Validation					
				LVL 0	LVL 1				
<u>Mass - PM2.5</u>	Particulate matter 2.5u	192.0	20.02	T	T				
2328									
<u>Trace elements</u>									
2329	Aluminum	0.07910	0.008	T	T				
2330	Antimony	0	0	T	T				
2331	Arsenic	0.07680	0.008	T	T				
2332	Barium	0.09270	0.009	T	T				
2333	Bromine	0	0	T	T				
2334	Cadmium	0.03500	0.003	T	T				
2335	Calcium	0.2430	0.025	T	T				
2336	Cerium	0.5797	0.060	T	T				
2337	Cesium	0.06220	0.006	T	T				
2338	Chlorine	0	0	T	T				
2339	Chromium	0.02600	0.002	T	T				
2340	Cobalt	0.002300	0.000	T	T				
2341	Copper	0.01130	0.001	T	T				
2342	Europium	0	0	T	T				
2343	Gallium	0	0	T	T				
2344	Gold	0.04520	0.004	T	T				
2345	Hafnium	0	0	T	T				
2346	Indium	0.003400	0.000	T	T				
2347	Iridium	0	0	T	T				
2348	Iron	0.7831	0.081	T	T				
2349	Lanthanum	0.1537	0.016	T	T				
2350	Lead	0.04520	0.004	T	T				
2351	Magnesium	0.4486	0.046	T	T				
2352	Manganese	0.1243	0.012	T	T				
2353	Mercury	0.03500	0.003	T	T				
2354	Molybdenum	0.01810	0.001	T	T				
2355	Nickel	0.004500	0.000	T	T				
2356	Niobium	0.01810	0.001	T	T				
2357	Phosphorus	0	0	T	T				
2358	Potassium	0.5243	0.054	T	T				
2359	Rubidium	0.01810	0.001	T	T				
2360	Samarium	0	0	T	T				
2361	Scandium	0	0	T	T				
2362	Selenium	0.02370	0.002	T	T				
2363	Silicon	0.2689	0.028	T	T				
2364	Silver	0.07010	0.007	T	T				
2365	Sodium	1.471	0.153	T	T				

Representative Sample Analysis (Cont.)

Laboratory Analysis Data					
Teflon Filter		I4888A			
Shipping Flags:					
Module Disassembly Flags:					
		Analyte Mass (ug)	Conc (ug/m3)	Lab Validation	
				LVL 0	LVL 1
<u>Trace elements</u>					
2366	Strontium	0.003400	0.000	T	T
2367	Sulfur	26.66	2.780	T	T
2368	Tantalum	0.07460	0.007	T	T
2369	Terbium	0	0	T	T
2370	Tin	0.09040	0.009	T	T
2371	Titanium	0.03160	0.003	T	T
2372	Vanadium	0.01020	0.001	T	T
2373	Wolfram	0.1006	0.010	T	T
2374	Yttrium	0.007900	0.000	T	T
2375	Zinc	0.5740	0.059	T	T
2376	Zirconium	0.006800	0.000	T	T

Representative Sample Analysis (Cont.)

LOCATION Roanoke	9/23/2002	AIRS_CODE 517700014	POC 5
SAMPLER TYPE	SASS Mini-Trends Configuration		
FIELD CUSTODY NO Q39375J	ROUTINE		
CHANNEL 2	SAMPLE VOLUME	9.627	
Sample Handling Validation Checks Performed	Level 0:	T	Level 1: T
Event Flags: DST	Flow Flags:		
Field Sampling Data			
		Value	
2377	Average flow	6.740	
2378	Avg ambient temp	19.00	
2379	Avg BP	734.0	
2380	Delta T Flag		
2381	End date	9/24/2002	
2382	End time	12:00 AM	
2383	Max ambient temp	25.00	
2384	Max BP	737.0	
2385	Min ambient temp	14.00	
2386	Min BP	731.0	
2387	Retrieval date	9/24/2002	
2388	Retrieval time	01:25 PM	
2389	Run Time	23.95	
2390	Run Time Flag		
2391	Sample volume	9.627	
2392	Start date	9/23/2002	
2393	Start time	12:00 AM	

Laboratory Analysis Data					
Teflon Filter	I4888B				
Shipping Flags:					
Module Disassembly Flags:					
	Analyte Mass (ug)	Conc (ug/m3)	Lab Validation		
			LVL 0	LVL 1	
<u>Cations - PM2.5 (NH4, Na, K)</u>					
2394	Ammonium	31.00	3.220	T	T
2395	m	0	0	T	T
2396	Potassium	0.4322	0.044	T	T
<u>Nitrate - PM2.5</u>	Sodium	6.150	0.638	T	T
2397	Nitrate	90.88	9.440	T	T
<u>Sulfate - PM2.5</u>	Sulfate				
2398					

Representative Sample Analysis (Cont.)

LOCATION Roanoke	9/23/2002	AIRS_CODE 517700014	POC 5
SAMPLER TYPE SASS Mini-Trends Configuration			
FIELD CUSTODY NO Q39375J	ROUTINE		
CHANNEL 3	SAMPLE VOLUME	9.549	
Sample Handling Validation Checks Performed	Level 0:	T	Level 1: T
Event Flags: DST	Flow Flags:		
Field Sampling Data			
			Value
2399	Average flow	6.680	
2400	Avg ambient temp	19.00	
2401	Avg BP	734.0	
2402	Delta T Flag		
2403	End date	9/24/2002	
2404	End time	12:00 AM	
2405	Max ambient temp	25.00	
2406	Max BP	737.0	
2407	Min ambient temp	14.00	
2408	Min BP	731.0	
2409	Retrieval date	9/24/2002	
2410	Retrieval time	01:25 PM	
2411	Run Time	23.95	
2412	Run Time Flag		
2413	Sample volume	9.549	
2414	Start date	9/23/2002	
2415	Start time	12:00 AM	

Laboratory Analysis Data					
Teflon Filter	I48904				
Shipping Flags:					
Module Disassembly Flags:					
		Analyte Mass (ug)	Conc (ug/m3)	Lab Validation	
				LVL 0	LVL 1
<u>Organic, elemental, and CO3 carbon Ext2 PM2.5</u>					
2416	Carbonate Carbon	0	0	T	T
2417	Elemental carbon	4.029	0.421	T	T
2418	OCX2	15.25	1.597	T	T
2419	Organic carbon	31.91	3.342	T	T
2420	Total carbon	35.94	3.764	T	T

2002 MONITORING SCHEDULE

3-Day Monitoring Schedule

January						
Su	M	Tu	W	Th	F	Sa
			1	2	3	4
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

February						
Su	M	Tu	W	Th	F	Sa
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28		

March						
Su	M	Tu	W	Th	F	Sa
						1
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

April						
Su	M	Tu	W	Th	F	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

May						
Su	M	Tu	W	Th	F	Sa
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

June						
Su	M	Tu	W	Th	F	Sa
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

July						
Su	M	Tu	W	Th	F	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

August						
Su	M	Tu	W	Th	F	Sa
			1	2	3	
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

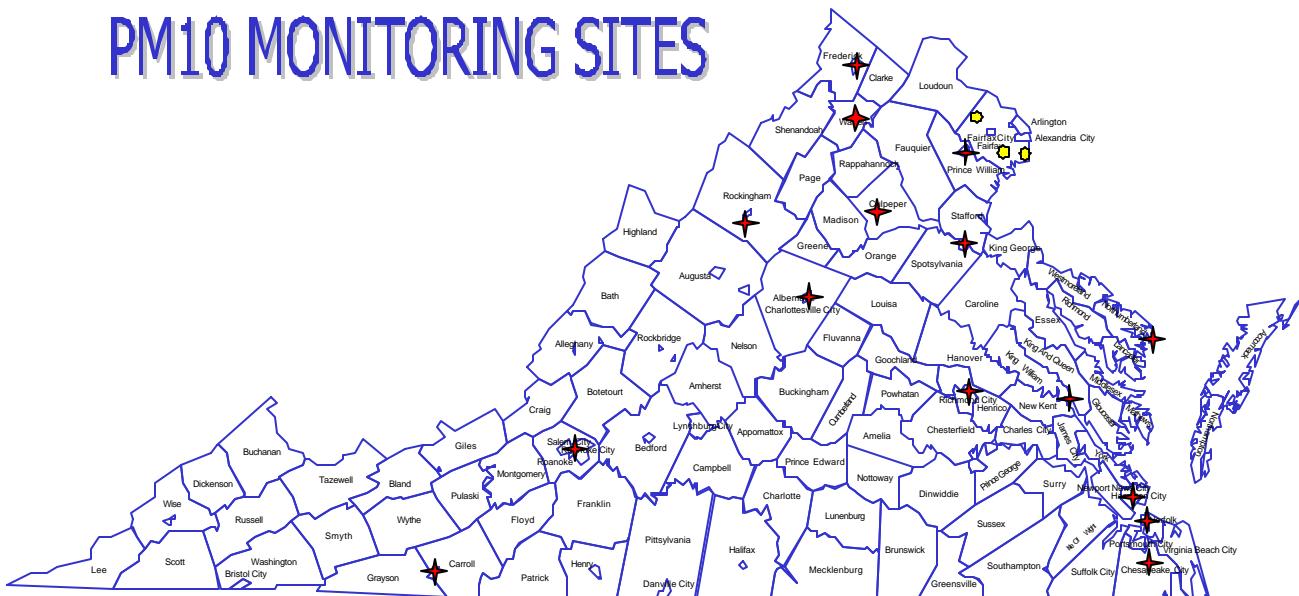
September						
Su	M	Tu	W	Th	F	Sa
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

October						
Su	M	Tu	W	Th	F	Sa
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

November						
Su	M	Tu	W	Th	F	Sa
				1	2	
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

December						
Su	M	Tu	W	Th	F	Sa
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

PM₁₀ MONITORING SITES



Reporting Organizations

- ★ VA Department of Environmental Quality
- ◆ Fairfax County Health Department

PM₁₀ is particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers. It is that portion of total suspended particulate that has the capability to penetrate the thoracic region of the human respiratory system. In addition to health effects, particles in this size range can impair visibility, have an effect on climate, and contribute to acidic dry deposition.

PM₁₀ samples are obtained by drawing ambient air through a specially designed particle size discrimination inlet at 40 cubic feet per minute for 24 hours. The particles in the PM₁₀ size range are collected on preweighed 8 x 10 inch microquartz filters which are subsequently reweighed to determine the particulate mass. The weighings are performed by the Virginia DEQ, Office of Air Quality Assessment, except for Fairfax County, which perform their own analyses. The results are reported as micrograms per cubic meter (ug/m³). The normal sampling schedule is every sixth day from midnight to midnight.

Stations meeting completeness criteria reported at least 75% of the total possible observations in a quarter, and collected enough data to produce four complete quarterly averages in a year.

VIRGINIA 2002
PM10 PARTICULATE MATTER SUMMARY BY REGION
METHOD CODE 62 - SIZE SELECTIVE INLET, GRAVIMETRIC
Micrograms Per Cubic Meter (ug/m³)
Sampling Schedule Every Six Days

LOCATION/ STATION NO.	24-HOUR SAMPLING				QUARTERLY ARITHMETIC MEAN				ANNUAL		
	NO. OBS.	MAX	2ND MAX	99 th PERCENTILE VALUE	I	II	III	IV	ARITH MEAN	CONC. >150	
SOUTHWEST REGION											
CARROLL CO. Galax, Gladeville Elem. School	23-A	57	37	34	37	14	19	23	10	17	0
VALLEY REGION											
HARRISONBURG Valley DEQ Office	26-E	60	48	47	48	21	20	29	18	22	0
WARREN CO. Front Royal, Memorial Hospital	30-E	60	43	43	43	14	18	23	15	17	0
CHARLOTTESVILLE 606 E. Market Street	127-B	55	50	39	50	15	19	27	16	19	0
WINCHESTER Winchester Courts Building	134-C	58	52	50	52	14	17	26	16	18	0
WEST CENTRAL REGION											
ROANOKE 101 Cherry Hill Circle	109-H	56	63	60	63	21	32*	39	20	28*	0

* Did not meet EPA's minimum requirements for data capture.

VIRGINIA 2002
PM10 PARTICULATE MATTER SUMMARY BY REGION
METHOD CODE 62 - SIZE SELECTIVE INLET, GRAVIMETRIC
Micrograms Per Cubic Meter (ug/m³)
Sampling Schedule Every Six Days

LOCATION/ STATION NO.	24-HOUR SAMPLING				QUARTERLY ARITHMETIC MEAN				ANNUAL	
	NO. OBS.	MAX	2ND MAX	99 TH PERCENTILE VALUE	I	II	III	IV	ARITH MEAN	CONC. >150
PIEDMONT REGION										
KING WILLIAM CO. West Point Elementary School	82-C	56	45	40	45	13	17	25	11	16
NORTHUMBERLAND CO. Reedville Pumping Station	94-A	56	55	30	55	8	14	23	11	14
RICHMOND 5324 Distributor Drive	158-S	60	47	37	47	15	18	26	13	18
TIDEWATER REGION										
CHESAPEAKE Oscar Smith Middle School	176-R	60	39	38	39	15	17	22	13	17
HAMPTON Va. School for the Deaf & Blind	179-C	59	37	37	37	14	17	22	13	16
NORFOLK NOAA Property	181-A1	54	39	38	39	14	19	22	12	17
NORTHERN REGION										
FREDERICKSBURG Mercer Elementary School	130-E	59	44	43	44	13	19	24	11	17

VIRGINIA 2002
PM10 PARTICULATE MATTER SUMMARY BY REGION
METHOD CODE 62 - SIZE SELECTIVE INLET, GRAVIMETRIC
Micrograms Per Cubic Meter (ug/m³)
Sampling Schedule Every Six Days

LOCATION/ STATION NO.	24-HOUR SAMPLING				QUARTERLY ARITHMETIC MEAN				ANNUAL		
	NO. OBS.	MAX	2ND MAX	99 TH PERCENTILE VALUE	I	II	III	IV	ARITH MEAN	CONC. >150	
NORTHERN REGION (cont.)											
CULPEPER CO. Farmington Elementary School	42-B	58	42	40	42	13	20	23	11	17	0
PRINCE WILLIAM CO. Manassas Health Department	45-A	57	51	46	51	13	19	25	13	18	0
FAIRFAX COUNTY											
FAIRFAX CO. Mt. Vernon, 2675 Sherwood Hall Ln.	L-46-B3	53	46	40	46	17	18	26*	15	19*	0
FAIRFAX CO. Chantilly, Upper Cub Run Treat. Plt.	L-46-F	54	57	45	57	11	19	25	15*	18*	0
FAIRFAX CO. Springfield, 6120 Brandon Avenue	L-46-Z	58	60	41	60	17	21	23	16	19	0

* Did not meet EPA's minimum requirements for data capture.

VIRGINIA 2002
PM10 PARTICULATE MATTER SUMMARY BY REGION
METHOD 62 - SIZE SELECTIVE INLET, GRAVIMETRIC
Micrograms Per Cubic Meter (ug/m³)
Sampling Schedule Every Six Days

LOCATION/ STATION NO.	NO. 24-HR. OBS.	NO. OF 24-HOUR CONCENTRATIONS IN RANGES						
		0 to 25	26 to 50	51 to 75	76 to 100	101 to 125	126 to 150	>150
SOUTHWEST REGION								
CARROLL CO. Galax, Gladeville Elem. School	23-A	57	47	10	0	0	0	0
VALLEY REGION								
HARRISONBURG Valley DEQ Office	26-E	60	41	19	0	0	0	0
WARREN CO. Front Royal, Memorial Hospital	30-E	60	51	9	0	0	0	0
CHARLOTTESVILLE 606 E. Market Street	127-B	55	47	8	0	0	0	0
WINCHESTER. Winchester Courts Building	134-C	58	50	7	1	0	0	0
WEST CENTRAL REGION								
ROANOKE 101 Cherry Hill Circle	109-H	56	26	26	4	0	0	0

VIRGINIA 2002
PM10 PARTICULATE MATTER SUMMARY BY REGION
METHOD 62 - SIZE SELECTIVE INLET, GRAVIMETRIC
Micrograms Per Cubic Meter (ug/m³)
Sampling Schedule Every Six Days

LOCATION/ STATION NO.	NO. 24-HR. OBS.	NO. OF 24-HOUR CONCENTRATIONS IN RANGES						
		0 to 25	26 to 50	51 to 75	76 to 100	101 to 125	126 to 150	>150
PIEDMONT REGION								
KING WILLIAM CO. 82-C West Point Elementary School	56	48	8	0	0	0	0	0
NORTHUMBERLAND CO. 94-A Reedville, Pumping Station	56	51	4	1	0	0	0	0
RICHMOND 158-S 5324 Distributor Drive	60	50	10	0	0	0	0	0
TIDEWATER REGION								
CHESAPEAKE 176-R Oscar Smith Middle School	60	53	7	0	0	0	0	0
HAMPTON 179-C Va. School for the Deaf & Blind	59	55	4	0	0	0	0	0
NORFOLK 181-A1 NOAA Property	54	47	7	0	0	0	0	0

VIRGINIA 2002
PM10 PARTICULATE MATTER SUMMARY BY REGION
METHOD 62 - SIZE SELECTIVE INLET, GRAVIMETRIC
Micrograms Per Cubic Meter (ug/m³)
Sampling Schedule Every Six Days

LOCATION/ STATION NO.	NO. 24-HR. OBS.	NO. OF 24-HOUR CONCENTRATIONS IN RANGES						
		0 to 25	26 to 50	51 to 75	76 to 100	101 to 125	126 to 150	>150
NORTHERN REGION								
FREDERICKSBURG Mercer Elementary School	130-E	59	50	9	0	0	0	0
CULPEPER CO. Farmington Elementary School	42-B	58	49	9	0	0	0	0
PRINCE WILLIAM CO. Manassas Health Department	45-A	57	49	7	1	0	0	0
FAIRFAX COUNTY								
FAIRFAX CO. Mt. Vernon, 2675 Sherwood Hall Ln.	L-46-B3	53	41	12	0	0	0	0
FAIRFAX CO. Chantilly, Upper Cub Run Treat. Plt.	L-46-F	54	44	9	1	0	0	0
FAIRFAX CO. Springfield, 6120 Brandon Avenue	L-46-Z	58	47	10	1	0	0	0

2002 MONITORING SCHEDULE

6-Day Monitoring Schedule for PM10

January						
Su	M	Tu	W	Th	F	Sa
			1	2	3	4
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

February						
Su	M	Tu	W	Th	F	Sa
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28		

March						
Su	M	Tu	W	Th	F	Sa
						1
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

April						
Su	M	Tu	W	Th	F	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

May						
Su	M	Tu	W	Th	F	Sa
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

June						
Su	M	Tu	W	Th	F	Sa
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

July						
Su	M	Tu	W	Th	F	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

August						
Su	M	Tu	W	Th	F	Sa
			1	2	3	
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

September						
Su	M	Tu	W	Th	F	Sa
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

October						
Su	M	Tu	W	Th	F	Sa
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

November						
Su	M	Tu	W	Th	F	Sa
				1	2	
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

December						
Su	M	Tu	W	Th	F	Sa
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

CO MONITORING SITES



Reporting Organizations

- ★ VA Department of Environmental Quality
- ★ Fairfax County Health Department

CARBON MONOXIDE (CO) is produced by incomplete combustion of carbon compounds, principally in internal combustion engines. Concentrations in the vicinity of heavily traveled highways are higher than ambient concentrations more than 100 meters from any highway. Carbon monoxide is not an irritant, and has little or no effect on plants or materials; however, it reacts in the bloodstream to deprive the heart and brain of oxygen. Moderate concentrations significantly reduce brain function and high concentrations can be lethal.

Carbon monoxide is measured continuously by infrared absorption photometry. Air is drawn continuously through a sample cell where infrared light passes through it. CO molecules in the air absorb part of the infrared light, reducing the intensity of the light reaching a light sensor. This portion of the infrared light absorbed by CO is converted into an electrical signal reflecting the CO concentration, and recorded.

VIRGINIA 2002
CARBON MONOXIDE SUMMARY BY REGIONS
METHOD 51, 67 AND 93 - NONDISPERSIVE INFRARED
Parts Per Million (ppm)

LOCATION/ STATION NO.	NO. 1-HR OBS.	ONE HOUR AVERAGES					EIGHT HOUR AVERAGES*				
		MAX	DATE TIME	2ND MAX	DATE TIME	>35	MAX	DATE TIME	2ND MAX	DATE TIME	>9
WEST CENTRAL REGION											
ROANOKE Carver Road	109-J	8655	4.5 7:00 PM	NOV 25 4.4	JAN 30 7:00 AM	0	3.0	JAN 6 MIDNIGHT	3.0	NOV 26 MIDNIGHT	0
PIEDMONT REGION											
RICHMOND Forest Hill Fire Station	158-U	8206	3.0 7:00 PM	NOV 20 2.8	JAN 25 9:00 PM	0	2.1	DEC 7 2:00 AM	2.0	NOV 25 10:00 PM	0
RICHMOND Science Museum of VA	158-W	8649	3.8 11:00 PM	FEB 18 3.3	FEB 18 10:00 PM	0	2.6	FEB 19 3:00 AM	1.8	DEC 28 2:00 AM	0
TIDEWATER REGION											
HAMPTON Va. School for the Deaf & Blind	179-C	8581	3.2 7:00 AM	FEB 25 3.0	FEB 8 8:00 AM	0	2.4	DEC 28 4:00 AM	2.1	FEB 19 3:00 AM	0
NORFOLK Post Office Garage	181-V	8542	6.4 7:00 AM	FEB 15 5.3	DEC 28 MIDNIGHT	0	4.0	DEC 28 3:00 AM	3.5	NOV 5 MIDNIGHT	0
NORFOLK Norfolk State University	181-Z	8645	7.1 7:00 PM	JAN 5 6.6	JAN 5 2:00 AM	0	5.1	JAN 6 MIDNIGHT	3.7	JAN 5 4:00 AM	0
NORTHERN REGION											
ARLINGTON CO. Aurora Hills Visitors Center	47-T	8630	3.4 7:00 AM	NOV 25 3.4	DEC 30 7:00 AM	0	2.7	JAN 11 2:00 AM	2.6	NOV 25 8:00 AM	0

*Eight Hour Averages stated as Ending Hour

VIRGINIA 2002
CARBON MONOXIDE SUMMARY BY REGION
METHOD 51 AND 54 - NONDISPERSIVE INFRA-RED
Parts Per Million (ppm)

LOCATION/ STATION NO.	NO. 1-HR OBS.	ONE HOUR AVERAGES					EIGHT HOUR AVERAGES*				
		MAX	DATE TIME	2ND MAX	DATE TIME	>35	MAX	DATE TIME	2ND MAX	DATE TIME	>9
NORTHERN REGION											
FRANCONIA Lee District Park	46-B9	8692	2.7 6:00 AM	NOV 25 2.7	NOV 25 7:00 AM	0	2.2	NOV 25 8:00 AM	1.5	DEC 10 4:00 PM	0
ALEXANDRIA											
ALEXANDRIA 517 N. St. Asaph Street	L-126-C	8646	4.1 7:00 PM	NOV 25 4.0	JAN 28 8:00 AM	0	2.6	NOV 25 8:00 AM	2.4	NOV 25 2:00 AM	0
FAIRFAX COUNTY											
FAIRFAX CO. McLean Governmental Center	L-46-A8	8551	3.3 7:00 PM	JAN 4 3.3	JAN 4 8:00 PM	0	2.3	NOV 25 MIDNIGHT	2.3	NOV 25 8:00 AM	0
FAIRFAX CO. Mason Governmental Center	L-46-C1**	5715	2.1 5:00 AM	NOV 25 2.1	NOV 25 7:00 AM	0	1.6	NOV 25 9:00 AM	1.5	DEC 10 11:00 PM	0
FAIRFAX CO. Upper Cub Run Treatment Plt.	L-46-F	6754	2.2 6:00 AM	JAN 28 1.4	JAN 28 9:00 AM	0	1.2	OCT 9 NOON	1.2	OCT 11 7:00 AM	0

*Eight Hour Averages stated as Ending Hour

** New Station

VIRGINIA 2002
CARBON MONOXIDE CONCENTRATIONS IN RANGES
METHOD 51, 67 AND 93 - NONDISPERSIVE INFRA-RED
Parts Per Million (ppm)

LOCATION/ STATION NO.	NO. 8-HR. OBS.	NUMBER OF 8-HOUR CONCENTRATIONS IN RANGES							
		0 to 4	5 to 8	9 to 12	13 to 16	17 to 20	21 to 24	25 to 28	>28
WEST CENTRAL REGION									
ROANOKE Carver Road	109-J	8755	8755	0	0	0	0	0	0
PIEDMONT REGION									
RICHMOND Forest Hill Fire Station	158-U	8259	8259	0	0	0	0	0	0
RICHMOND Science Museum of VA	158-W	8737	8737	0	0	0	0	0	0
TIDEWATER REGION									
HAMPTON Va. School for the Deaf & Blind	179-C	8681	8681	0	0	0	0	0	0
NORFOLK Post Office Garage	181-V	8654	8654	0	0	0	0	0	0
NORFOLK Norfolk State University	181-Z	8749	8745	4	0	0	0	0	0
NORTHERN REGION									
ARLINGTON CO. Aurora Hills Visitors Center	47-T	8729	8729	0	0	0	0	0	0

VIRGINIA 2002
CARBON MONOXIDE CONCENTRATIONS IN RANGES
METHODS 51 AND 54 - NONDISPERSIVE INFRA-RED
Parts Per Million (ppm)

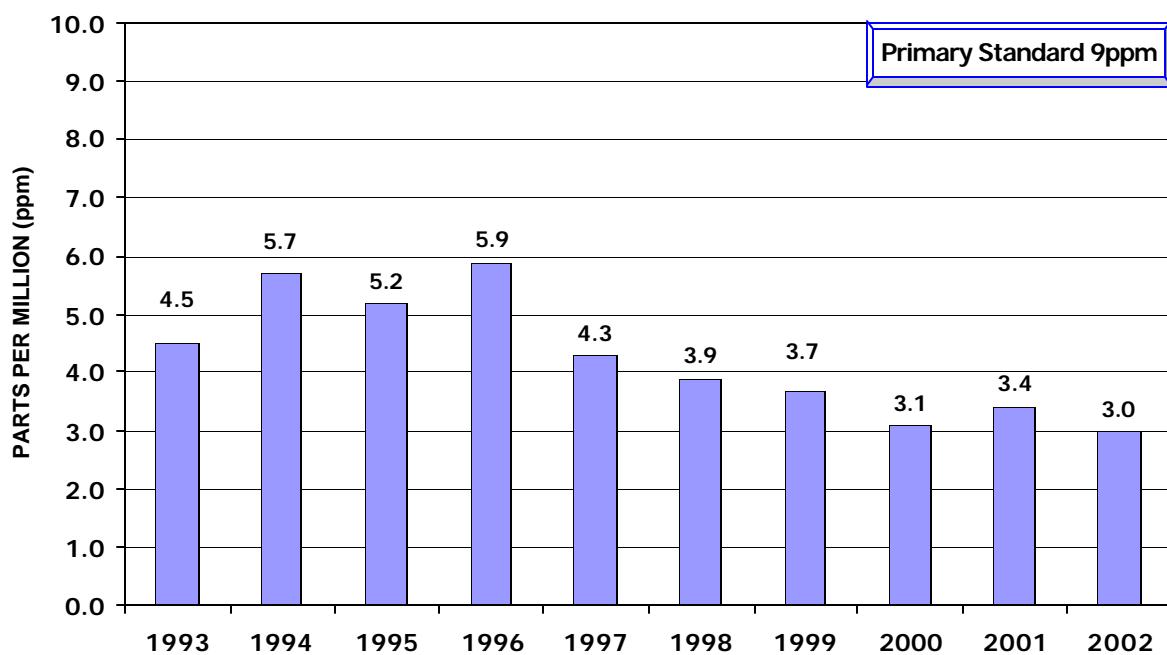
REGION/LOCATION STATION NO.	NO. 8-HR. OBS.	NUMBER OF 8-HOUR CONCENTRATIONS IN RANGES							
		0 to 4	5 to 8	9 to 12	13 to 16	17 to 20	21 to 24	25 to 28	>28
NORTHERN REGION									
FRANCONIA Lee District Park	46-B9	8721	8721	0	0	0	0	0	0
ALEXANDRIA									
ALEXANDRIA 517 N. St. Asaph St.	L-126-C	8673	8673	0	0	0	0	0	0
FAIRFAX COUNTY									
FAIRFAX CO. 1437 Balls Hill Road	L-46-A8	8552	8552	0	0	0	0	0	0
FAIRFAX CO. Mason Governmental Center	L-46-C1*	5716	5716	0	0	0	0	0	0
FAIRFAX CO. Upper Cub Run Treatment Plt.	L-46-F	6777	6777	0	0	0	0	0	0

* New Station

CARBON MONOXIDE, WEST CENTRAL

EIGHT HOUR 2ND MAXIMUM

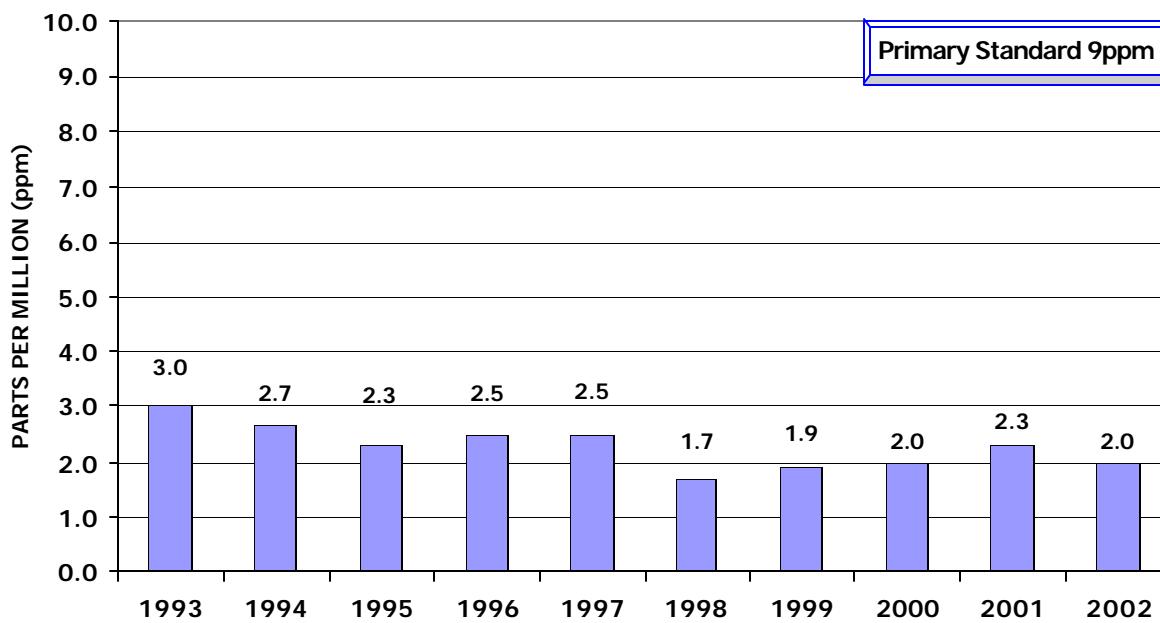
109-J, Carver Road, Roanoke



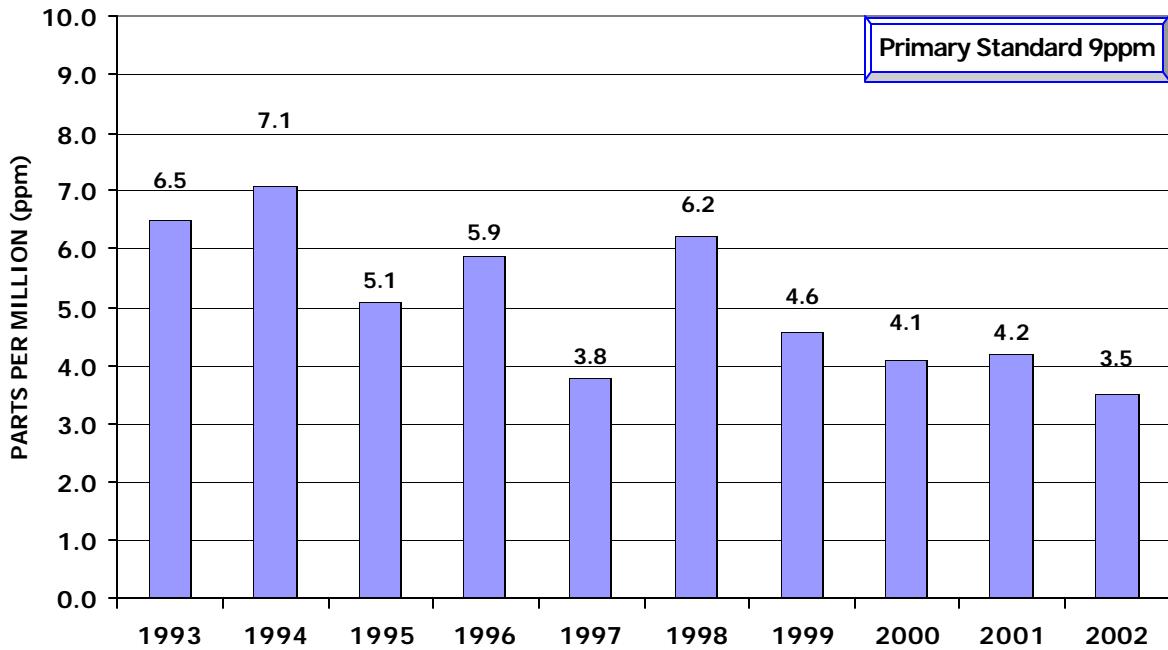
CARBON MONOXIDE, PIEDMONT REGION

EIGHT HOUR 2ND MAXIMUM

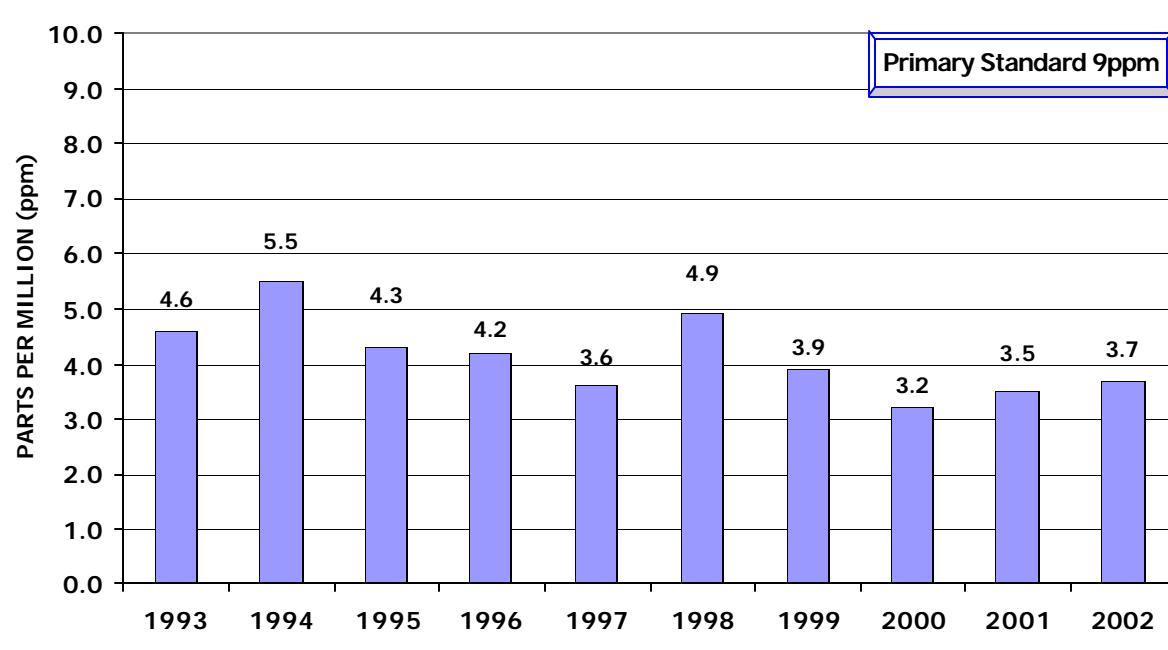
158-U, Forest Hill Fire Station, Richmond



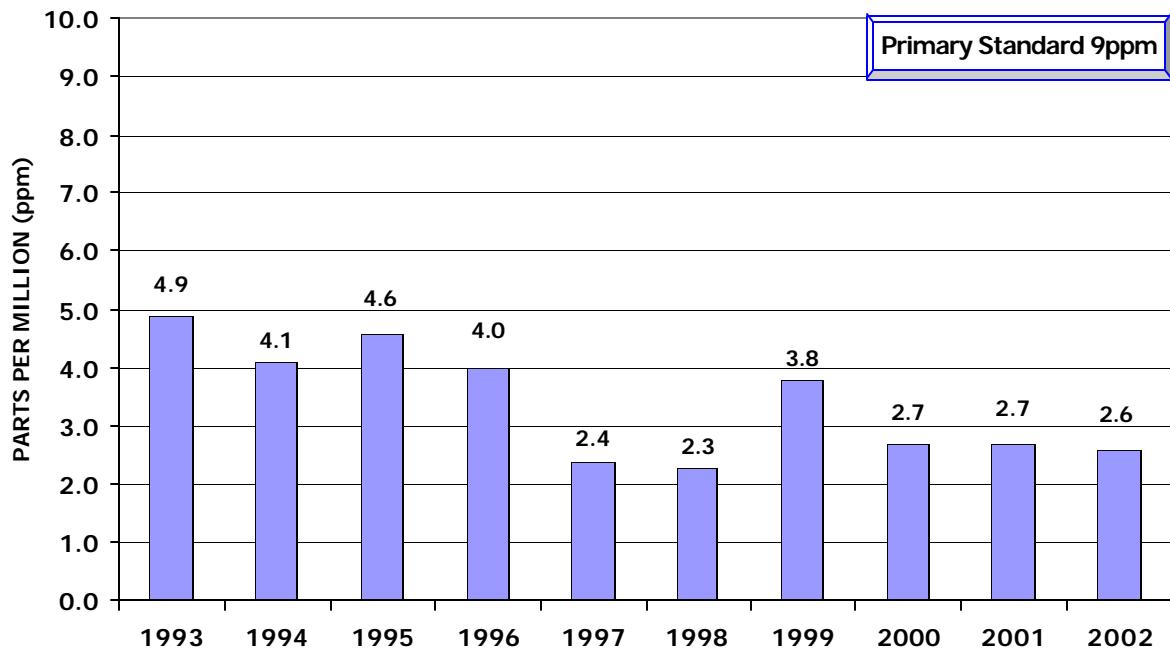
CARBON MONOXIDE, TIDEWATER REGION
EIGHT HOUR 2ND MAXIMUM
181-V, Post Office, Norfolk



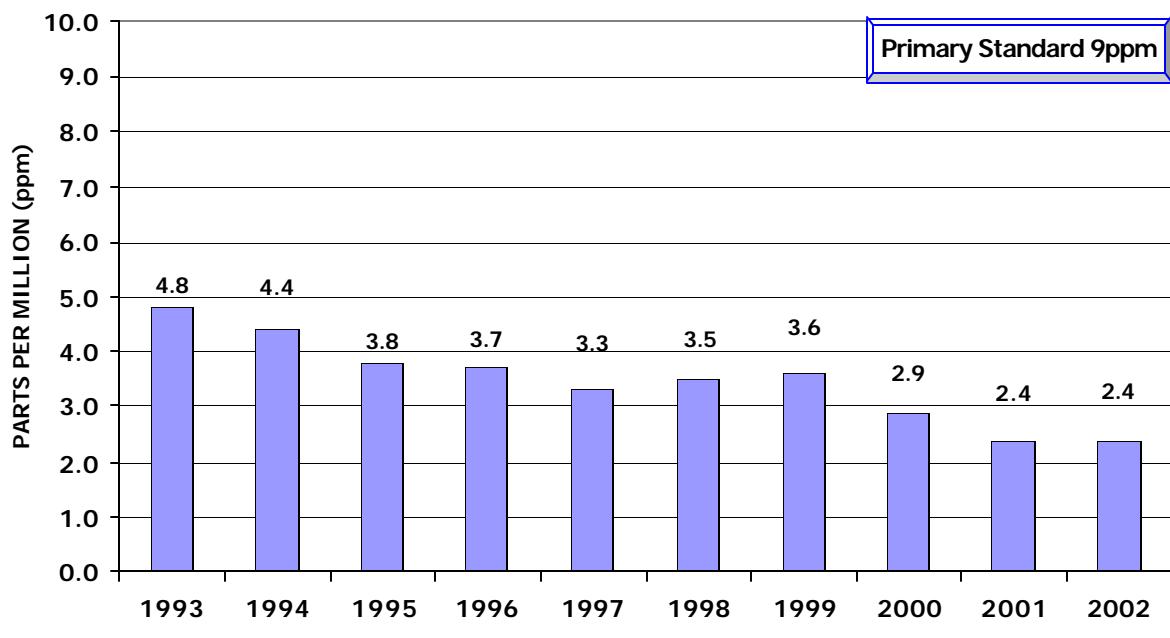
CARBON MONOXIDE, TIDEWATER REGION
EIGHT HOUR 2ND MAXIMUM
181-Z, Norfolk State University, Norfolk



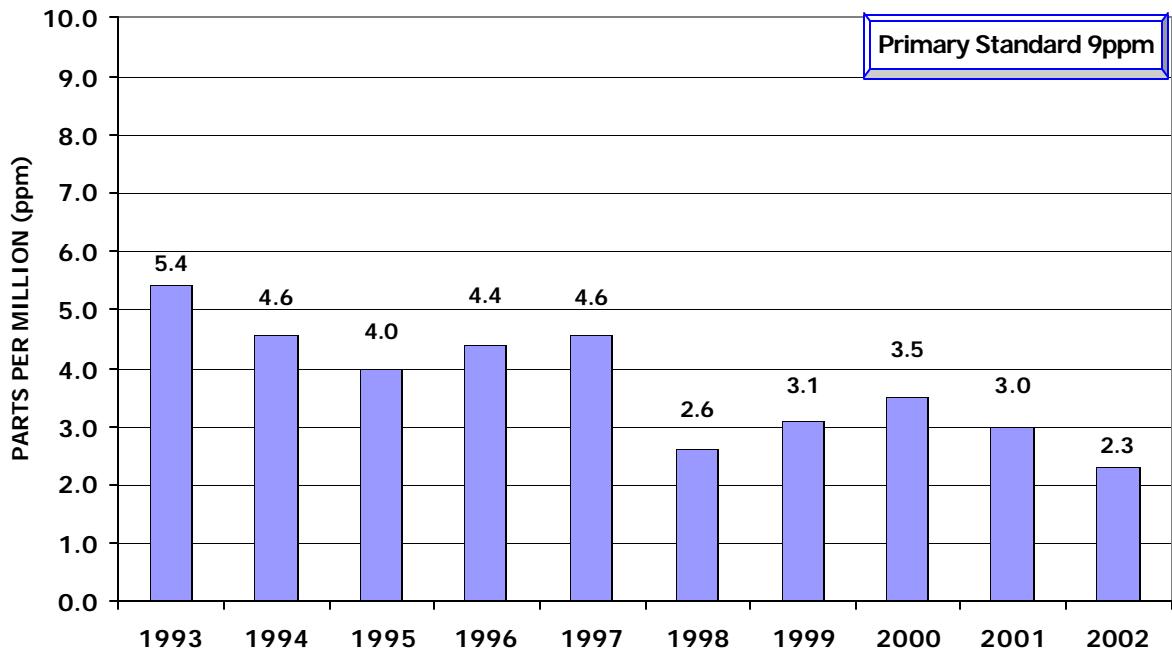
CARBON MONOXIDE, NORTHERN REGION
EIGHT HOUR 2ND MAXIMUM
47-T, Aurora Hills Visitor Center, Arlington County



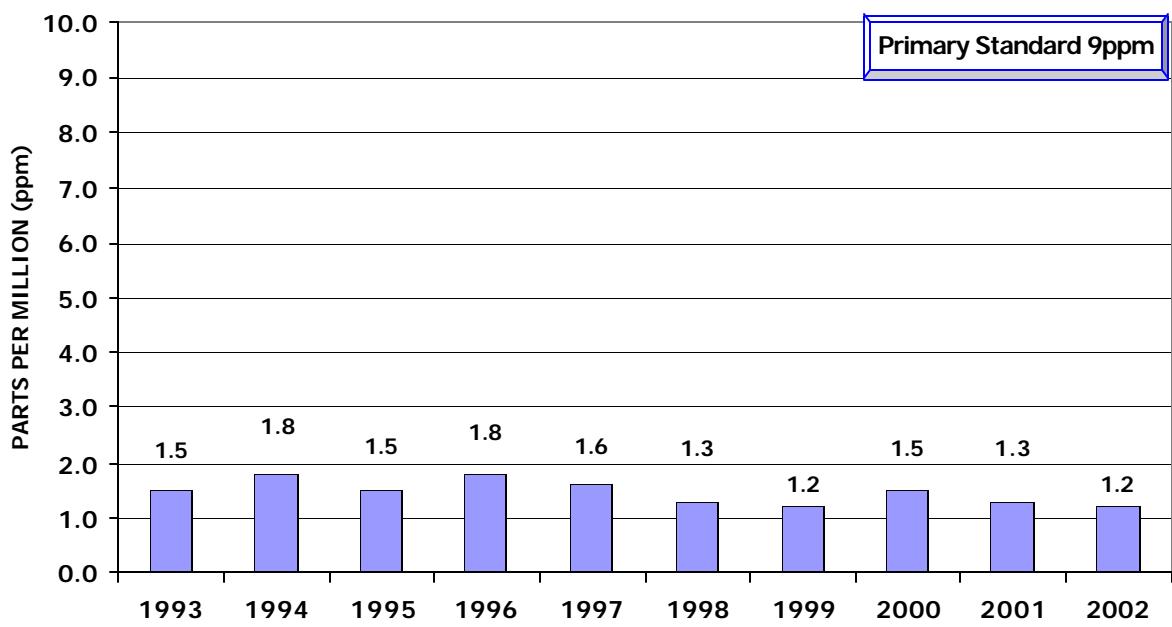
CARBON MONOXIDE, ALEXANDRIA
EIGHT HOUR 2ND MAXIMUM
L-126-C, 517 North Saint Asaph Street



CARBON MONOXIDE, FAIRFAX COUNTY
EIGHT HOUR 2ND MAXIMUM
L-46-A8, McLean



CARBON MONOXIDE, FAIRFAX COUNTY
EIGHT HOUR 2ND MAXIMUM
L-46-F, Chantilly



SO₂ MONITORING SITES



Reporting Organizations

- ★ VA Department of Environmental Quality
- ★ Fairfax County Health Department

SULFUR DIOXIDE (SO₂) results from combustion processes (mainly burning of fossil fuels containing sulfur compounds), refining of petroleum, manufacture of sulfuric acid, and smelting of ore containing sulfur. Once in the atmosphere, some sulfur dioxide can be oxidized (either photochemically or in the presence of a catalyst) to SO₃ (sulfur trioxide). With water vapor, SO₃ is converted to sulfuric acid mist. Other basic oxides combine with SO₃ to form sulfate aerosols. These compounds can be transported long distances and fall back to earth as acid rain. SO₂ causes chlorosis in plant leaves and in moist air forms acids that damage structural materials. Their irritating effects in the respiratory tract are magnified by high particulate levels.

Sulfur dioxide is measured continuously with a fluorescence analyzer. Air is drawn through a sample cell where it is subjected to high intensity ultraviolet light. Sulfur dioxide molecules in the air are excited and fluoresce, releasing light characteristic of SO₂. The fluorescence is detected with a photomultiplier tube and converted to an electrical signal related to the SO₂ concentration.

VIRGINIA 2002
SULFUR DIOXIDE SUMMARY BY REGIONS
METHOD 61 AND 60 - ULTRAVIOLET FLUORESCENCE
Parts Per Million (ppm)

LOCATION/ STATION NO.	NO. 24-HR OBS.	FIXED MIDNIGHT TO MIDNIGHT 24-HOUR AVERAGES						ANNUAL ARITHMETIC MEAN
		24-HR. MAX	DATE	24-HR. 2ND MAX	DATE	>.14		
VALLEY REGION								
ROCKINGHAM CO. Valley DEQ Office	26-E	365	.010	JAN 3	.008	SEP 5	0	.002
WEST CENTRAL REGION								
VINTON East Vinton Elementary School	19-A6	365	.011	DEC 6	.009	JAN 3	0	.003
PIEDMONT REGION								
CHARLES CITY CO. Route 608	75-B	355	.032	DEC 27	.021	JUN 11	0	.005
RICHMOND Science Museum	158-W	364	.025	JUL 13	.018	SEP 19	0	.004
TIDEWATER REGION								
HAMPTON Virginia School	179-C	362	.024	JAN 2	.021	DEC 6	0	.004
NORFOLK Norfolk State University	181-Z	360	.041	FEB 26	.031	JUL 23	0	.006
ALEXANDRIA								
ALEXANDRIA 517 North St. Asaph Street	L-126-C	355	.028	MAR 16	.021	OCT 16	0	.006

VIRGINIA 2002
SULFUR DIOXIDE SUMMARY BY REGIONS
METHOD 009 - PULSED FLUORESCENT
Parts Per Million (ppm)

LOCATION/ STATION NO.	NO. 24-HR OBS.	FIXED MIDNIGHT TO MIDNIGHT 24-HOUR AVERAGES						
		24-HR. MAX	DATE	24-HR. 2ND MAX	DATE	>.14	ANNUAL ARITHMETIC MEAN	
FAIRFAX CO.								
FAIRFAX CO. 1437 Balls Hill Road	L-46-A8	363	.021	JAN 1	.018	DEC 27	0	.007
FAIRFAX CO. Mason Governmental Center	L-46-C1*	234	.017	DEC 18	.015	AUG 23	0	.005
FAIRFAX CO. Upper Cub Run Sewage Treatment Plant	L-46-F	364	.014	JAN 1	.011	DEC 18	0	.004

* New Station

VIRGINIA 2002
SULFUR DIOXIDE SUMMARY BY REGIONS
METHOD 61 AND 60 - ULTRAVIOLET FLUORESCENCE
Parts Per Million (ppm)

LOCATION/ STATION NO.	NO. 1-HR OBS.	3-HOUR BLOCK AVERAGES						>.5	ANNUAL ARITHMETIC MEAN
		3-HR. MAX	DATE	3-HR. 2ND MAX	DATE	>.5			
VALLEY REGION									
ROCKINGHAM CO. Valley DEQ Office	26-E	8605	.019	SEP 5 2:00 AM	.015	JAN 3 8:00 PM	0		.002
WEST CENTRAL REGION									
VINTON East Vinton Elementary School	19-A6	8645	.022	DEC 6 2:00 AM	.021	JAN 16 11:00 PM	0		.003
PIEDMONT REGION									
CHARLES CITY CO. Route 608	75-B	8401	.083	JUN 11 8:00 PM	.076	JAN 15 11:00 AM	0		.005
RICHMOND Science Museum	158-W	8641	.091	SEP 19 11:00 AM	.066	JUL 13 11:00 AM	0		.004
TIDEWATER REGION									
HAMPTON Virginia School	179-C	8571	.046	AUG 2 11:00 PM	.046	SEP 13 11:00 PM	0		.004
NORFOLK Norfolk State University	181-Z	8518	.121	SEP 3 11:00 AM	.089	FEB 26 5:00 AM	0		.006
ALEXANDRIA									
ALEXANDRIA 517 North St. Asaph Street	L-126-C	8425	.096	MAR 16 8:00 PM	.091	OCT 16 8:00 AM	0		.006

VIRGINIA 2002
SULFUR DIOXIDE SUMMARY BY REGIONS
METHOD 009 - PULSED FLUORESCENT
Parts Per Million (ppm)

LOCATION/ STATION NO.	NO. 1-HR OBS.	3-HOUR BLOCK AVERAGES						
		3-HR. MAX	DATE	3-HR. 2ND MAX	DATE	>.5	ANNUAL ARITHMETIC MEAN	
FAIRFAX CO.								
FAIRFAX CO. 1437 Balls Hill Road	L-46-A8	8653	.038	AUG 23 2:00 PM	.033	JAN 1 5:00 AM	0	.007
FAIRFAX CO. Mason Governmental Center	L-46-C1*	5665	.044	OCT 22 11:00 AM	.037	DEC 18 11:00 AM	0	.005
FAIRFAX CO. Upper Cub Run Treatment Plant	L-46-F	8703	.026	FEB 19 8:00 PM	.020	JAN 1 11:00 AM	0	.004

* New Station

VIRGINIA 2002
SULFUR DIOXIDE CONCENTRATIONS IN RANGES
METHODS 60 and 61 - ULTRAVIOLET FLUORESCENCE
Parts Per Million (ppm)

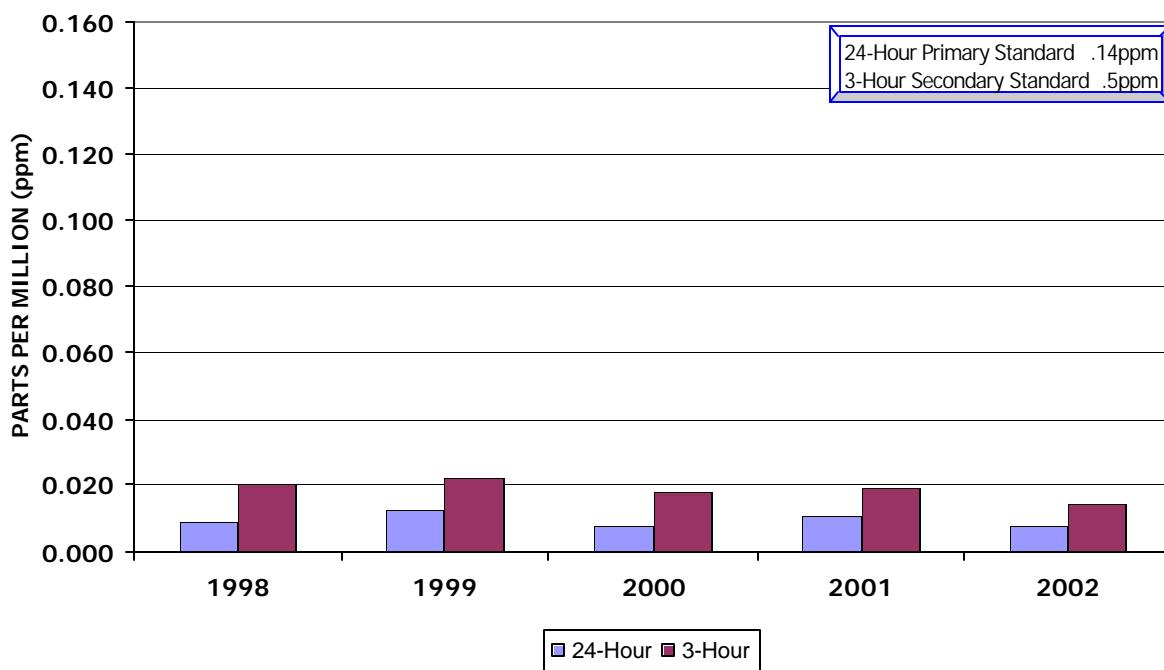
LOCATION/ STATION NO.	NO. 24-HR. OBS.	NUMBER OF 24-HOUR CONCENTRATIONS IN RANGES							
		.00 to .04	.05 to .08	.09 to .12	.13 to .16	.17 to .20	.21 to .24	.25 to .28	>.28
VALLEY REGION									
ROCKINGHAM CO. Valley DEQ Office	26-E	365	365	0	0	0	0	0	0
WEST CENTRAL REGION									
VINTON East Vinton Elementary School	19-A6	365	365	0	0	0	0	0	0
PIEDMONT REGION									
CHARLES CITY CO. Route 608	75-B	355	355	0	0	0	0	0	0
RICHMOND Science Museum	158-W	364	364	0	0	0	0	0	0
TIDEWATER REGION									
HAMPTON Virginia School	179-C	362	362	0	0	0	0	0	0
NORFOLK Norfolk State University	181-Z	360	360	0	0	0	0	0	0
ALEXANDRIA									
ALEXANDRIA 517 North St. Asaph Street	L-126-C	355	355	0	0	0	0	0	0

VIRGINIA 2002
SULFUR DIOXIDE CONCENTRATIONS IN RANGES
METHODS 61 AND 009 - ULTRA VIOLET FLUORESCENCE
Parts Per Million (ppm)

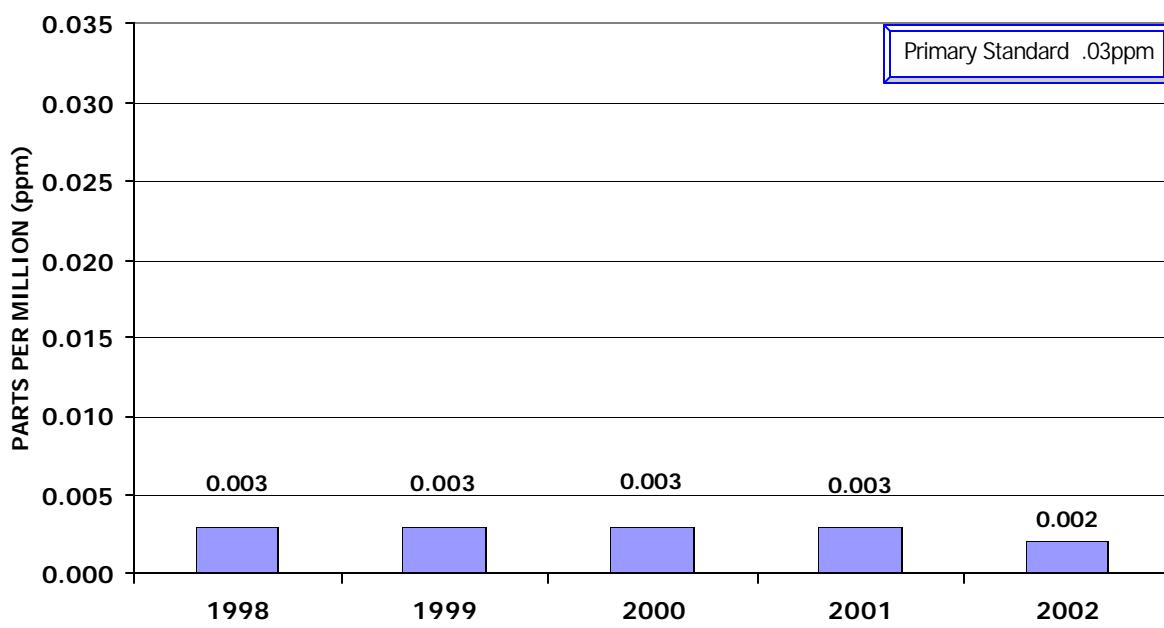
LOCATION/ STATION NO.	NO. 24-HR. OBS.	NUMBER OF 24-HOUR CONCENTRATIONS IN RANGES							
		.00 to .04	.05 to .08	.09 to .12	.13 to .16	.17 to .20	.21 to .24	.25 to .28	>.28
		FAIRFAX COUNTY							
FAIRFAX CO. L-46-A8 1437 Balls Hill Road	363	363	0	0	0	0	0	0	0
FAIRFAX CO. L-46-C1* Mason Governmental Center	234	234	0	0	0	0	0	0	0
FAIRFAX CO. L-46-F Upper Cub Run Sewage Treatment Plant	364	364	0	0	0	0	0	0	0

* New Station

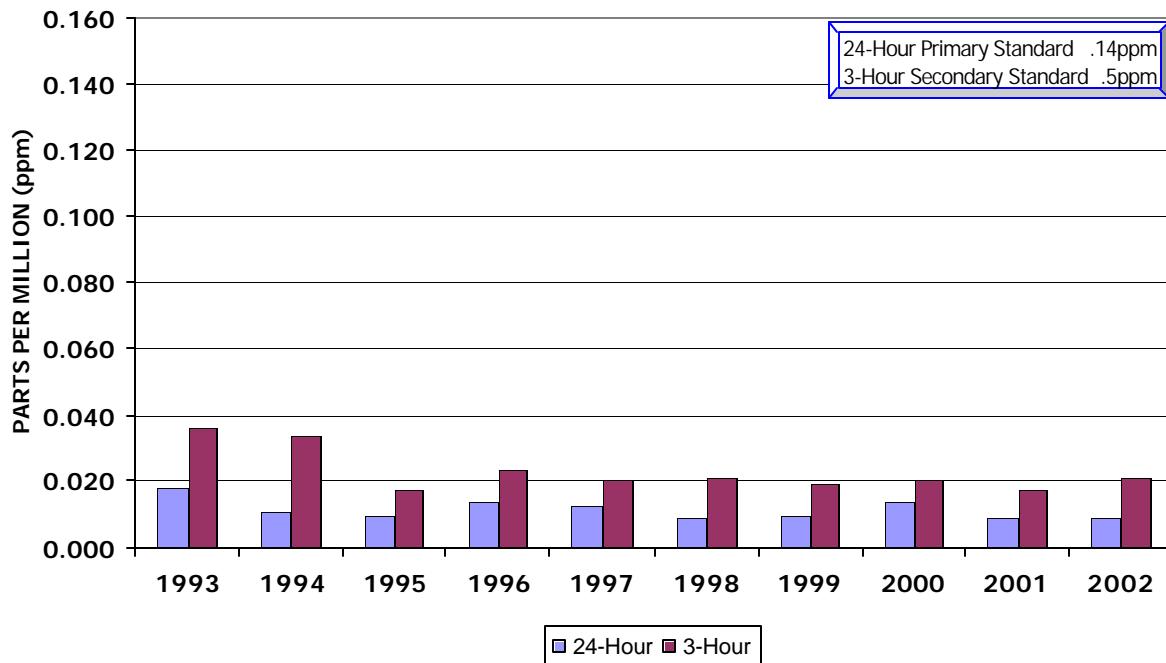
SULFUR DIOXIDE, VALLEY REGION
2ND MAXIMUM VALUE
26-E, Rockingham County



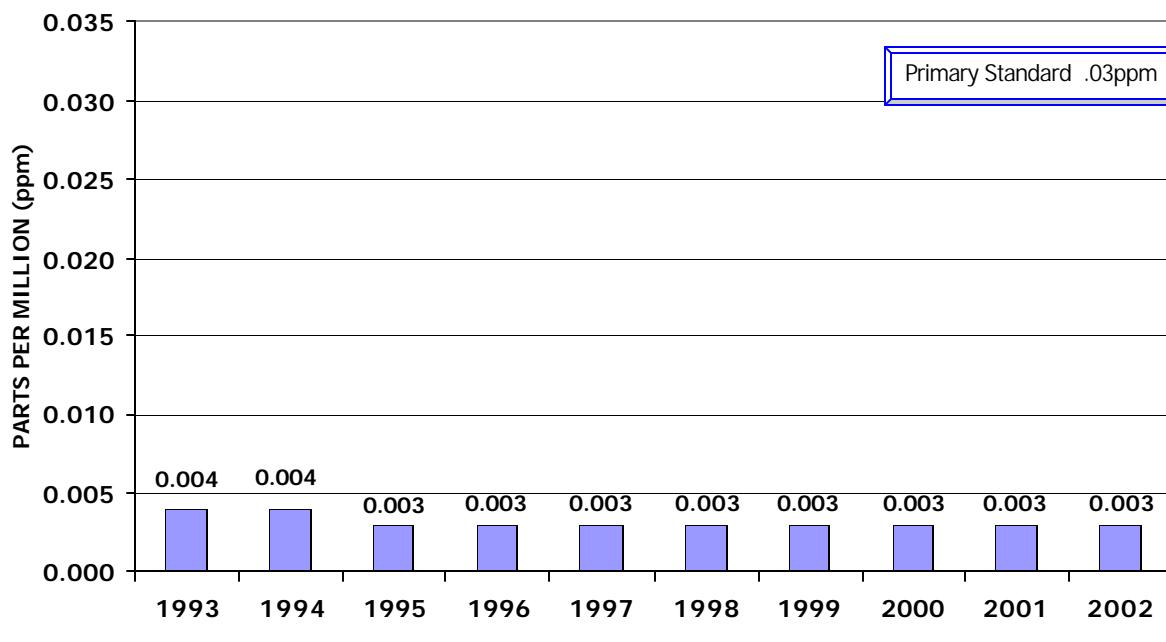
SULFUR DIOXIDE, VALLEY REGION
ANNUAL ARITHMETIC MEAN
26-E, Rockingham County



SULFUR DIOXIDE, WEST CENTRAL REGION
2ND MAXIMUM VALUE
19-A6, Vinton Elementary School



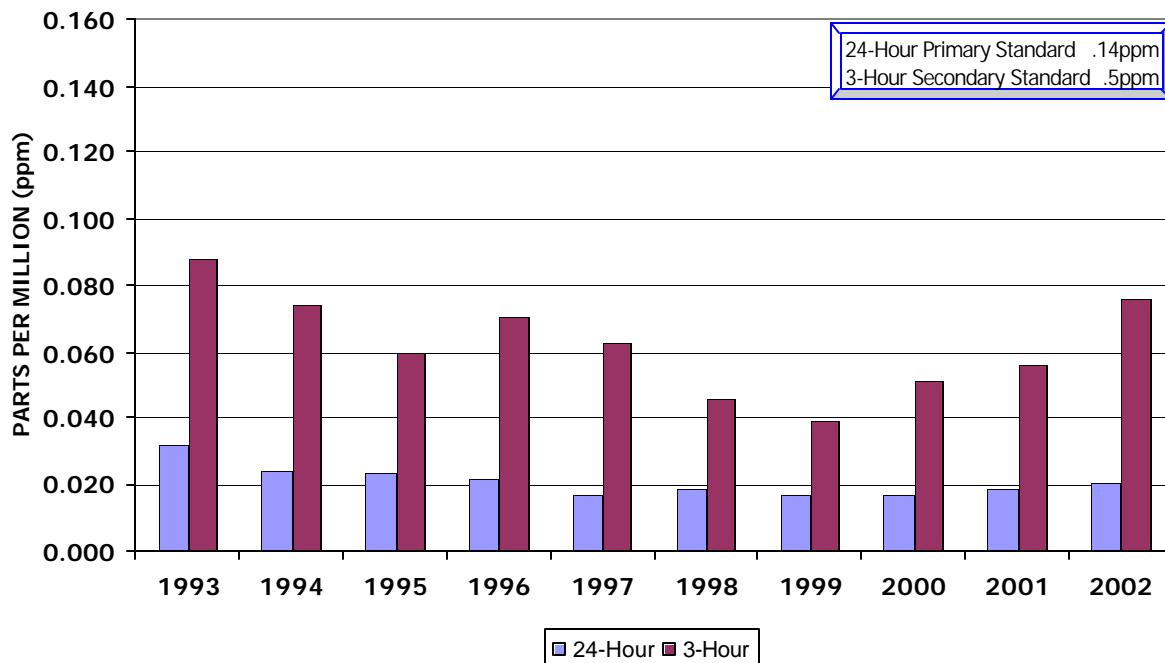
SULFUR DIOXIDE, WEST CENTRAL REGION
ANNUAL ARITHMETIC MEAN
19-A6, Vinton Elementary School, Vinton



SULFUR DIOXIDE, PIEDMONT REGION

2ND MAXIMUM VALUE

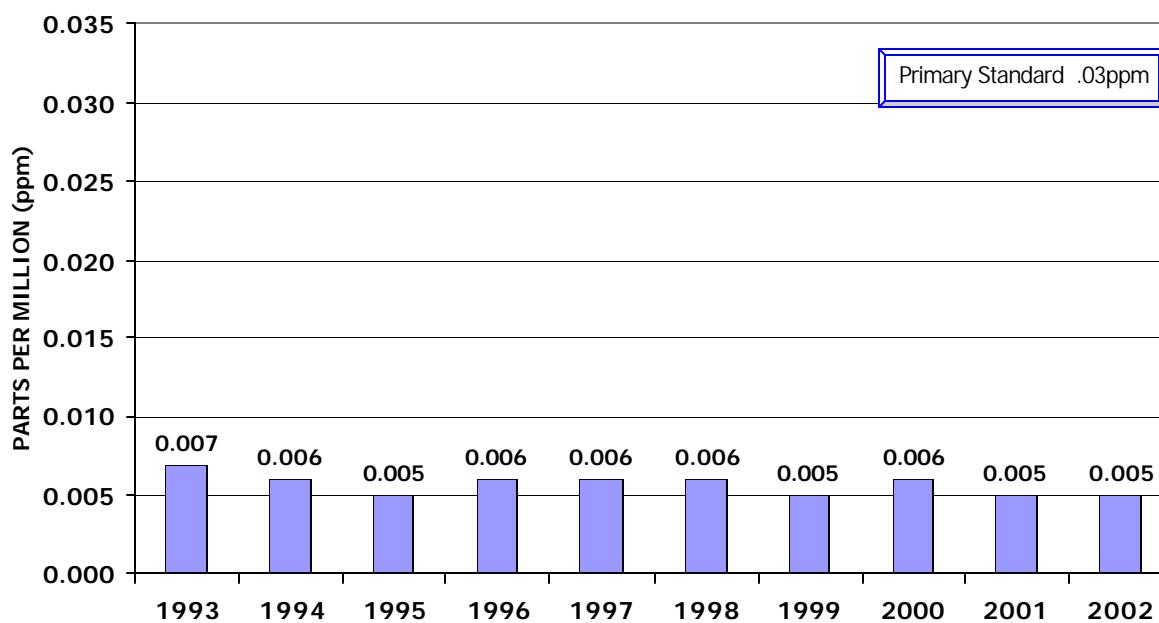
75-B, Charles City County



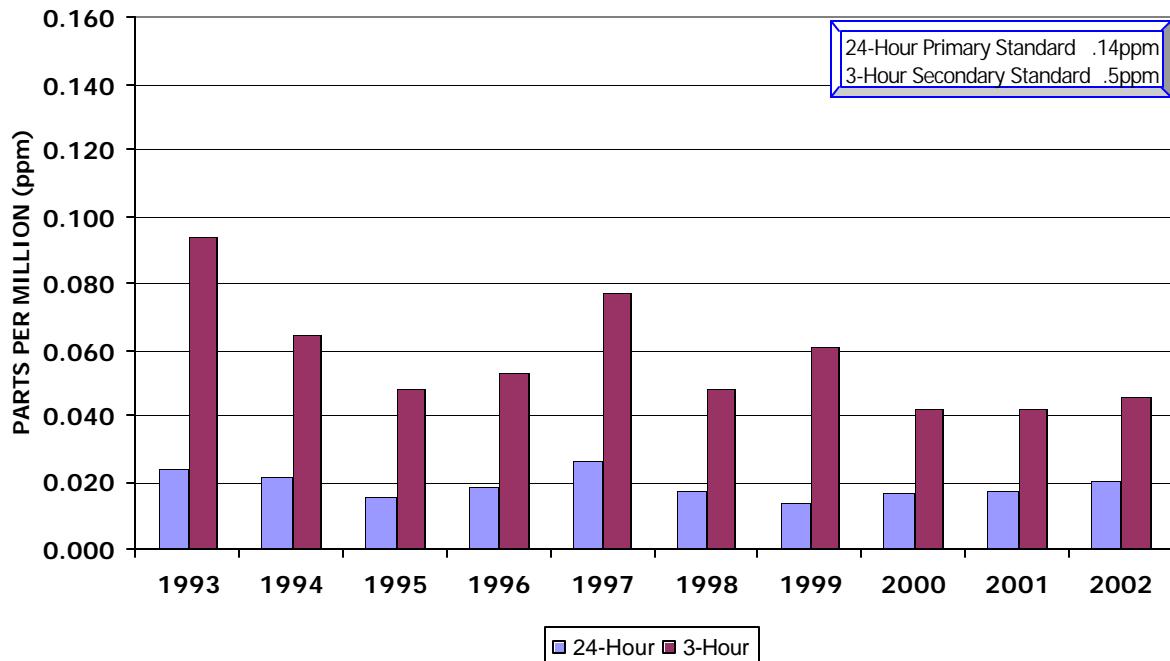
SULFUR DIOXIDE, PIEDMONT REGION

ANNUAL ARITHMETIC MEAN

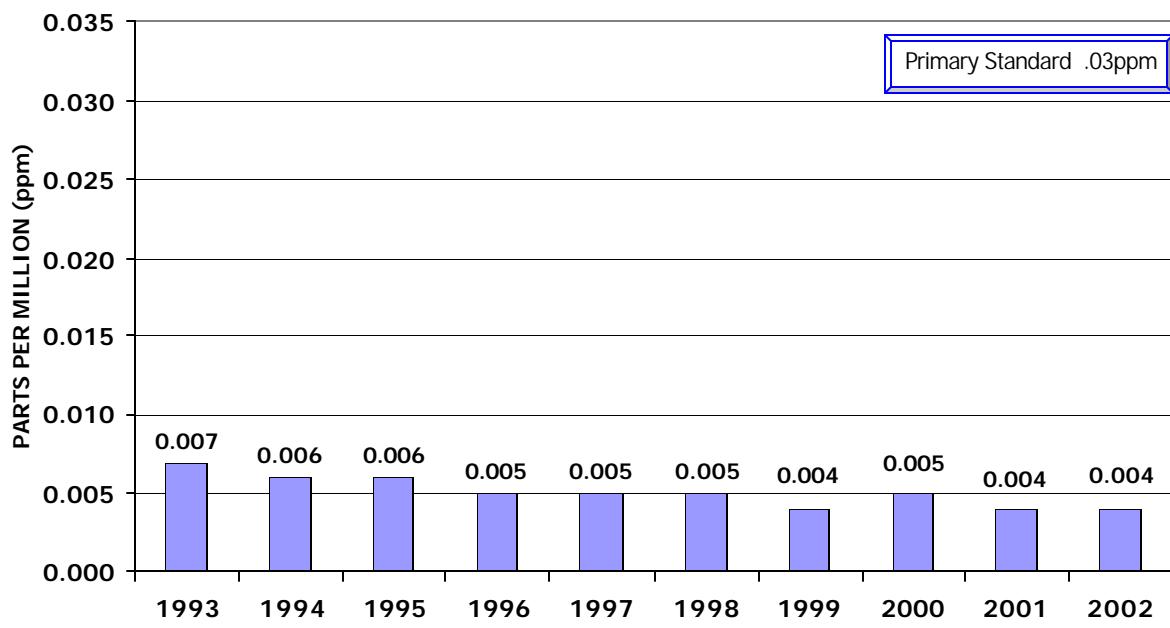
75-B, Charles City County



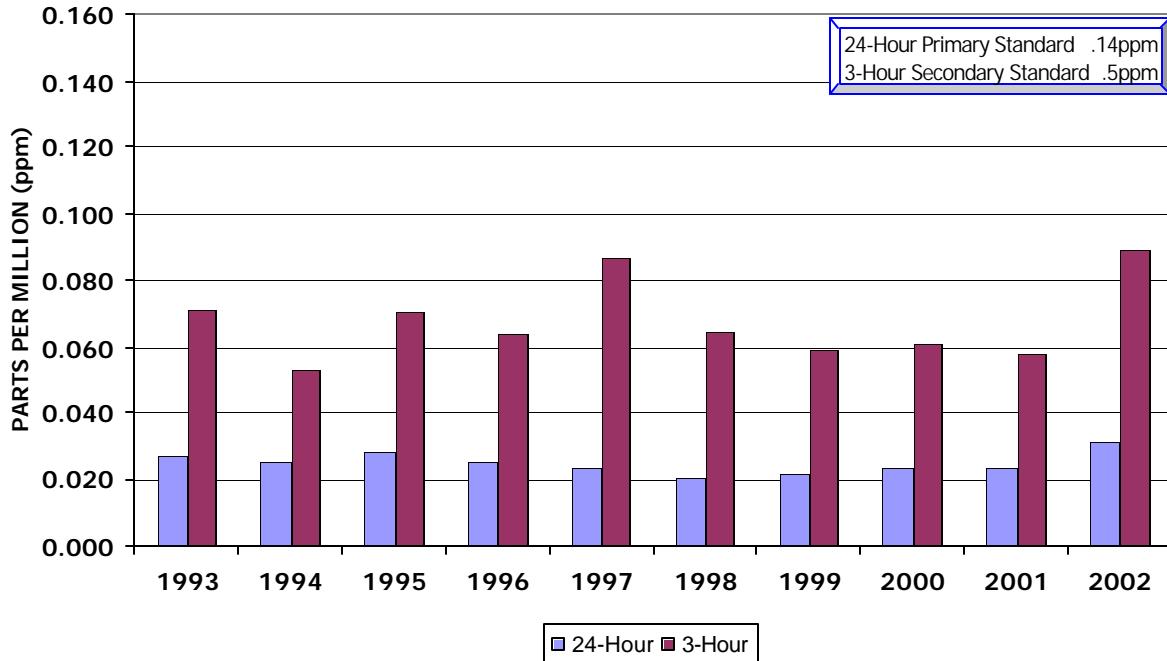
SULFUR DIOXIDE, TIDEWATER REGION
2ND MAXIMUM VALUE
179-C, Virginia School, Hampton



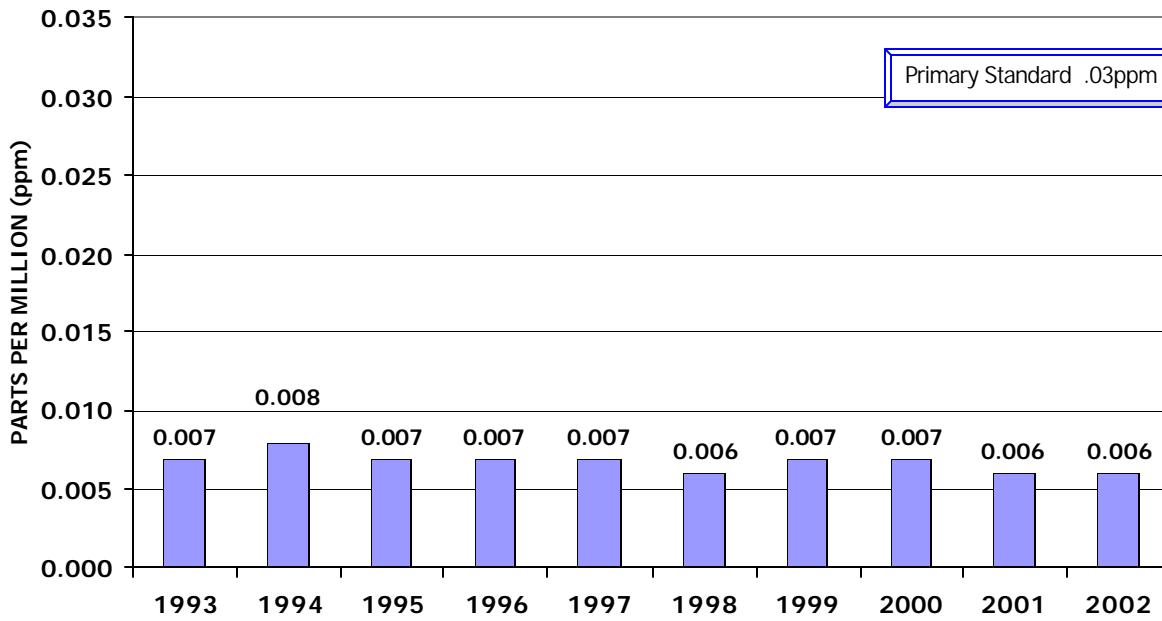
SULFUR DIOXIDE, TIDEWATER REGION
ANNUAL ARITHMETIC MEAN
179-C, Virginia School, Hampton



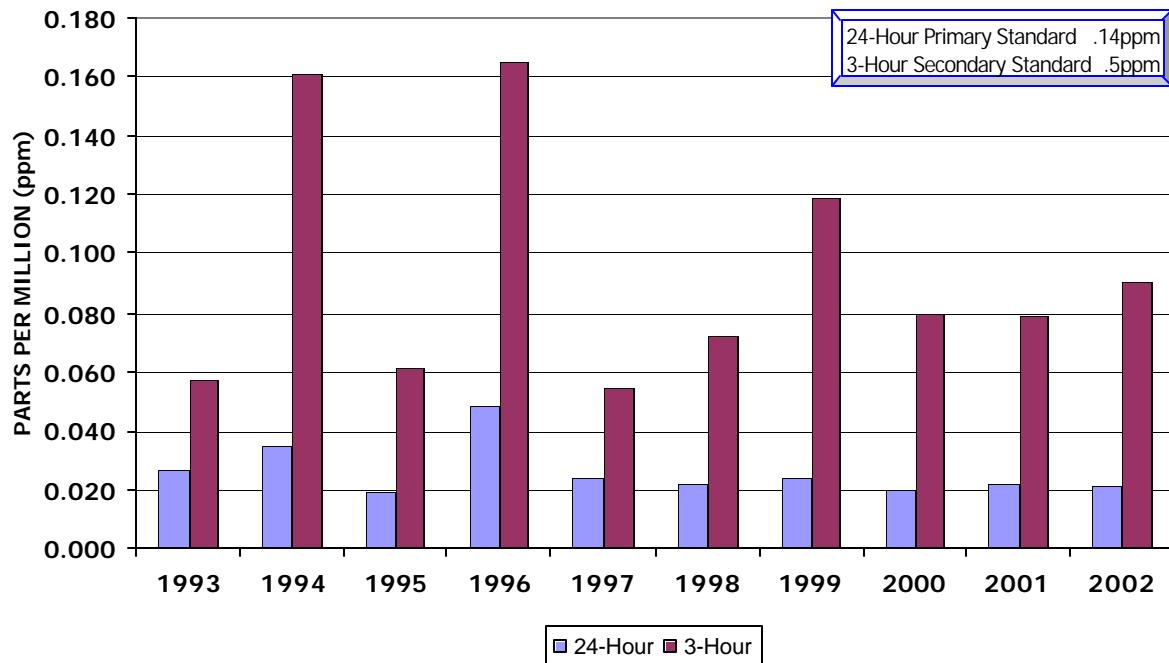
SULFUR DIOXIDE, TIDEWATER REGION
2ND MAXIMUM VALUE
181-Z, Norfolk State University, Norfolk



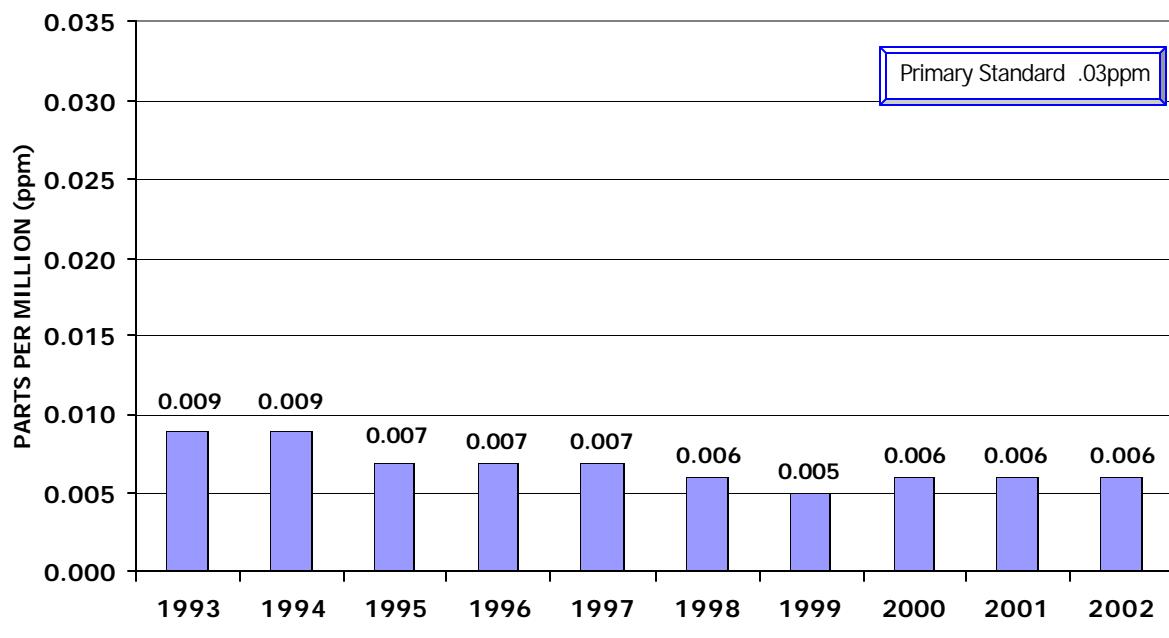
SULFUR DIOXIDE, TIDEWATER REGION
ANNUAL ARITHMETIC MEAN
181-Z, Norfolk State University, Norfolk



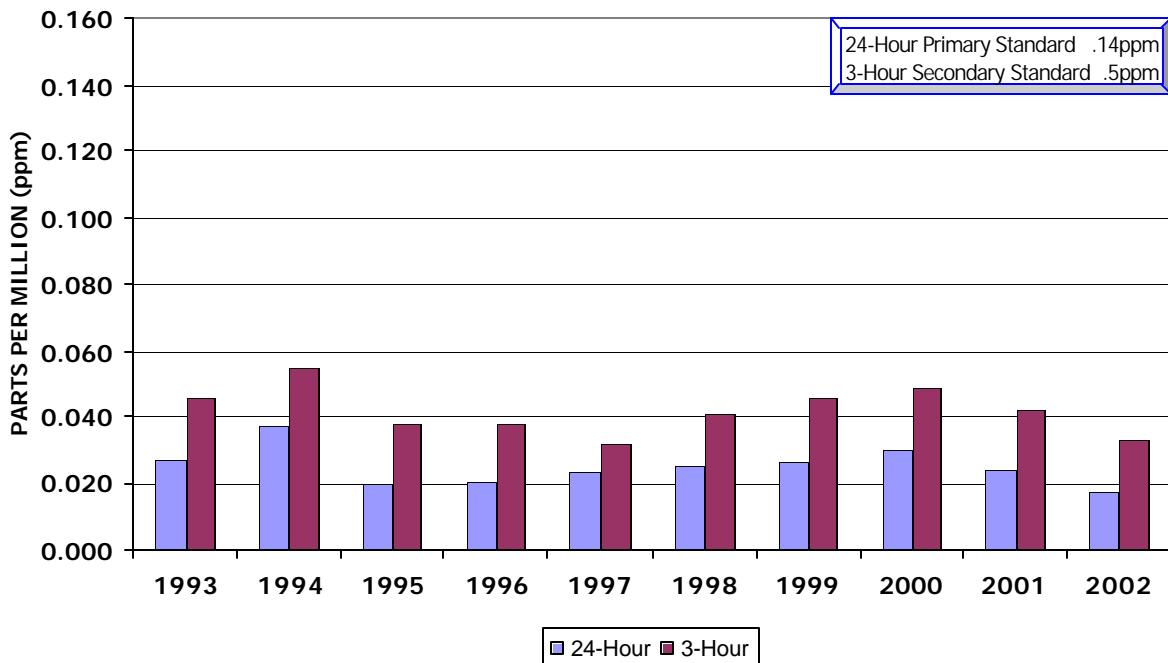
SULFUR DIOXIDE, ALEXANDRIA
2ND MAXIMUM VALUE
L-126-C, 517 North Saint Asaph Street



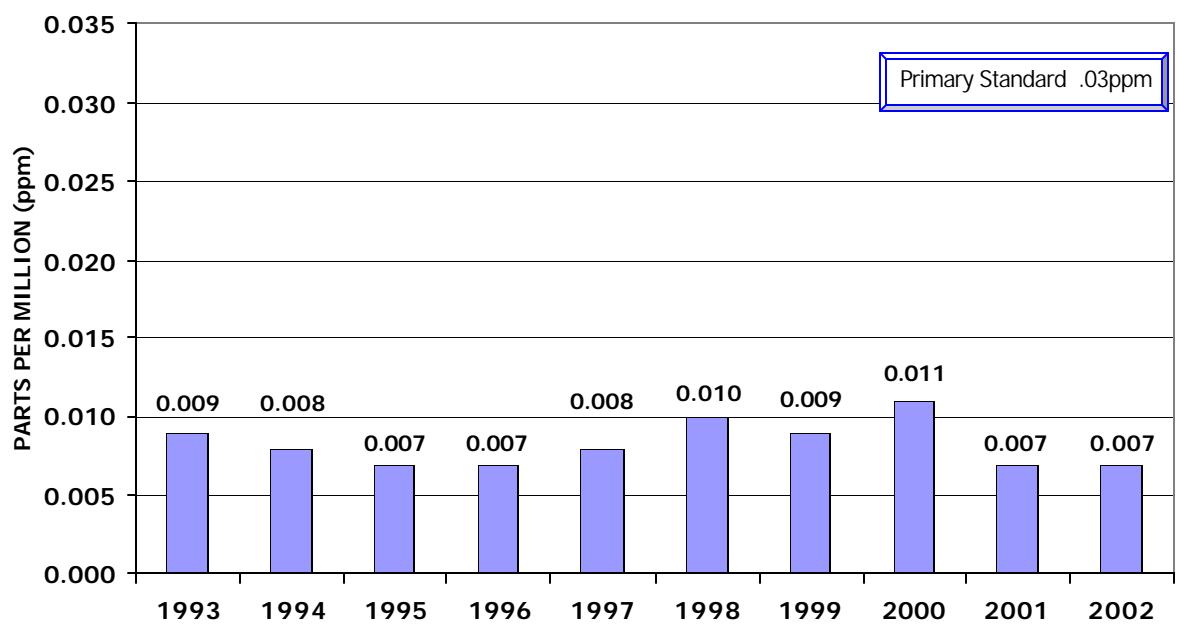
SULFUR DIOXIDE, ALEXANDRIA
ANNUAL ARITHMETIC MEAN
L-126-C, 517 North Saint Asaph Street



SULFUR DIOXIDE, FAIRFAX COUNTY
2ND MAXIMUM VALUE
L-46-A8, McLean Governmental Center, Fairfax County



SULFUR DIOXIDE, FAIRFAX COUNTY
ANNUAL ARITHMETIC MEAN
L-46-A8, McLean Governmental Center, Fairfax County



NO₂ MONITORING SITES



Reporting Organizations

- ★ VA Department of Environmental Quality
- ◆ Fairfax County Health Department

NITROGEN DIOXIDE (NO₂), a secondary derivative of atmospheric nitric oxide, is formed when combustion temperatures are extremely high, as in the burning of coal, oil, gas, and gasoline, and has been clearly established as exerting detrimental effect on human health and welfare. NO₂ in high concentrations can cause impairment of dark adaptation, increase airway resistance and respiratory rate, and enhance susceptibility to respiratory infections.

Nitrogen oxides (NO, NO₂, NO_x) are measured continuously using the chemiluminescent reaction of nitric oxide (NO) with ozone (O₃). Air is drawn through the analyzer continuously, and mixed with a high concentration of ozone in a reaction chamber. Any NO in the air reacts with the ozone to produce NO₂ which releases light having a characteristic spectrum. The light resulting from the reaction is detected with a photomultiplier tube, and converted to an electrical signal reflecting the NO concentration. Total nitrogen oxides (NO_x) are measured by passing the air through a converter where any NO₂ in the air is reduced to NO before passing the air on to the reaction chamber. By alternately passing the air directly to the reaction chamber, and through the converter before the reaction chamber, the analyzer alternately measures NO and NO_x. The NO₂ concentration is the difference between NO and NO_x.

VIRGINIA 2002
NITROGEN DIOXIDE SUMMARY BY REGION
METHOD 25 AND 74 - CHEMILUMINESCENCE
Parts Per Million (ppm)

LOCATION/ STATION NO.	HOURLY VALUES						
	NO. 1-HOUR OBS.	1-HR. MAX	DATE TIME	1-HOUR 2ND MAX	DATE TIME	ANNUAL ARITHMETIC MEAN	ANNUAL MEAN >.05
WEST CENTRAL REGION							
VINTON East Vinton Elementary School	19-A6	8611	.054 4:00 AM	JUN 22 .054	AUG 13 1:00 AM	.013	0
PIEDMONT REGION							
CHARLES CITY CO. Route 608	75-B	8389	.109 7:00 PM	JUL 8 .098	JUN 11 9:00 PM	.012	0
RICHMOND Science Museum	158-W	7731	.079 11:00 PM	AUG 8 .077	AUG 1 11:00 PM	.020	0
TIDEWATER REGION							
NORFOLK Norfolk State University	181-Z	8426	.085 8:00 PM	MAY 24 .082	MAY 21 9:00 PM	.018	0
NORTHERN REGION							
ASHBURN Broad Run High School	38-I	8506	.052 9:00 PM	SEP 21 .051	MAR 7 8:00 PM	.014	0
ARLINGTON CO. Aurora Hills Visitors Center	47-T	8454	.090 9:00 PM	SEP 9 .086	SEP 9 10:00 PM	.022	0
PRINCE WILLIAM CO. Long Park	45-L	8468	.047 6:00 PM	SEP 9 .047	DEC 10 5:00 PM	.011	0
CAROLINE CO. Corbin	48-A	7060	.040 3:00 AM	MAR 25 .040	MAR 25 4:00 AM	.006	0

VIRGINIA 2002
NITROGEN DIOXIDE SUMMARY BY REGION
METHOD 25 AND 74 - CHEMILUMINESCENCE
Parts Per Million (ppm)

LOCATION/ STATION NO.	NO. 1-HOUR OBS.	HOURLY VALUES					
		1-HR. MAX	DATE TIME	1-HOUR 2ND MAX	DATE TIME	ANNUAL ARITHMETIC MEAN	ANNUAL MEAN >.05
ALEXANDRIA							
ALEXANDRIA 517 North St. Asaph Street	L-126-C	8193	.083	JUN 24 10:00 PM	.080	JUN 24 9:00 PM	.025
FAIRFAX CO.							
FAIRFAX CO. 1437 Balls Hill Road	L-46-A8	6076	.071	JAN 6 1:00 AM	.067	JUN 24 9:00 PM	.019*
FAIRFAX CO. Mason Governmental Center	L-46-C1**	5667	.075	SEP 9 7:00 PM	.071	SEP 9 8:00 PM	.018
FAIRFAX CO. Upper Cub Run Treatment Plant	L-46-F	8401	.050	JAN 28 9:00 AM	.044	DEC 8 11:00 AM	.009

* Did not meet EPA's minimum data capture requirements

** New Station

VIRGINIA 2002
NITROGEN DIOXIDE CONCENTRATIONS IN RANGES
METHOD 25 AND 74 - CHEMILUMINESCENCE
Parts Per Million (ppm)

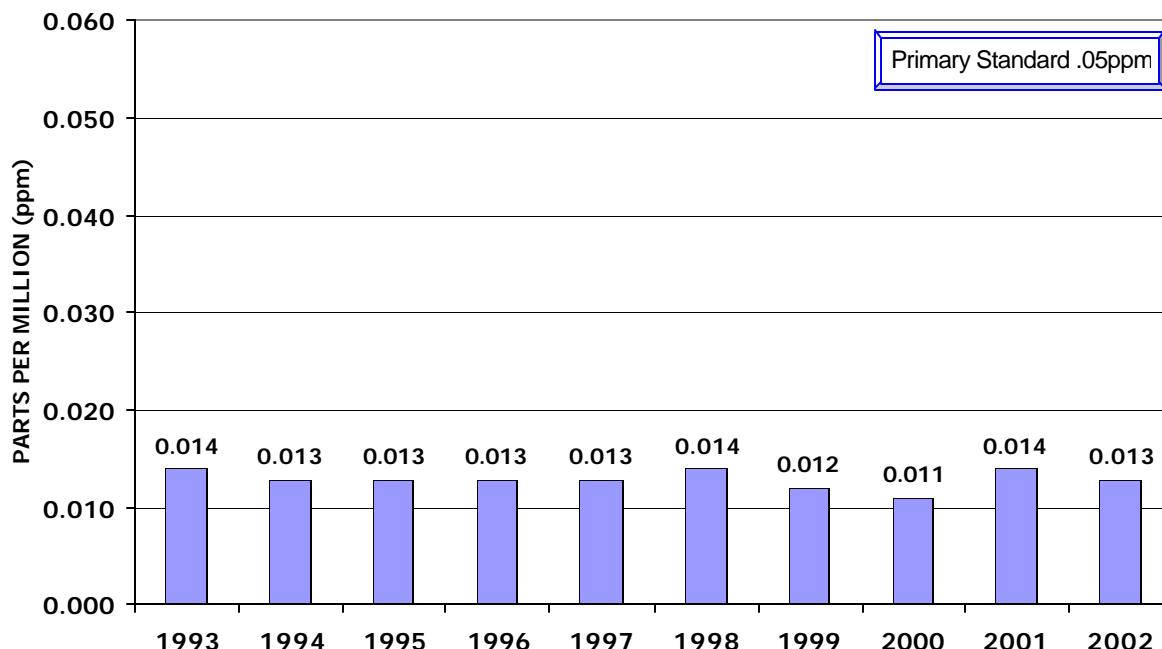
LOCATION/ STATION NO.	NO. 1-HR. OBS.	NUMBER OF 1-HOUR CONCENTRATIONS IN RANGES							
		.00 to .04	.05 to .08	.09 to .12	.13 to .16	.17 to .20	.21 to .24	.25 to .28	>.28
WEST CENTRAL REGION									
VINTON 19-A6 East Vinton Elementary School	8611	8581	30	0	0	0	0	0	0
PIEDMONT REGION									
CHARLES CITY CO. 75-B Route 608	8389	8293	93	3	0	0	0	0	0
RICHMOND 158-W Science Museum	7731	7500	231	0	0	0	0	0	0
TIDEWATER REGION									
NORFOLK 181-Z Norfolk State University	8426	8323	102	1	0	0	0	0	0
NORTHERN REGION									
ASHBURN 38-I Broad Run High School	8506	8475	31	0	0	0	0	0	0
ARLINGTON CO. 47-T Aurora Hills Visitors Center	8454	7970	482	2	0	0	0	0	0
PRINCE WILLIAM CO. 45-L Long Park	8468	8460	8	0	0	0	0	0	0
CAROLINE CO. 48-A Corbin	7060	7060	0	0	0	0	0	0	0

VIRGINIA 2002
NITROGEN DIOXIDE CONCENTRATIONS IN RANGES
METHOD 25 AND 74 - CHEMILUMINESCENCE
Parts Per Million (ppm)

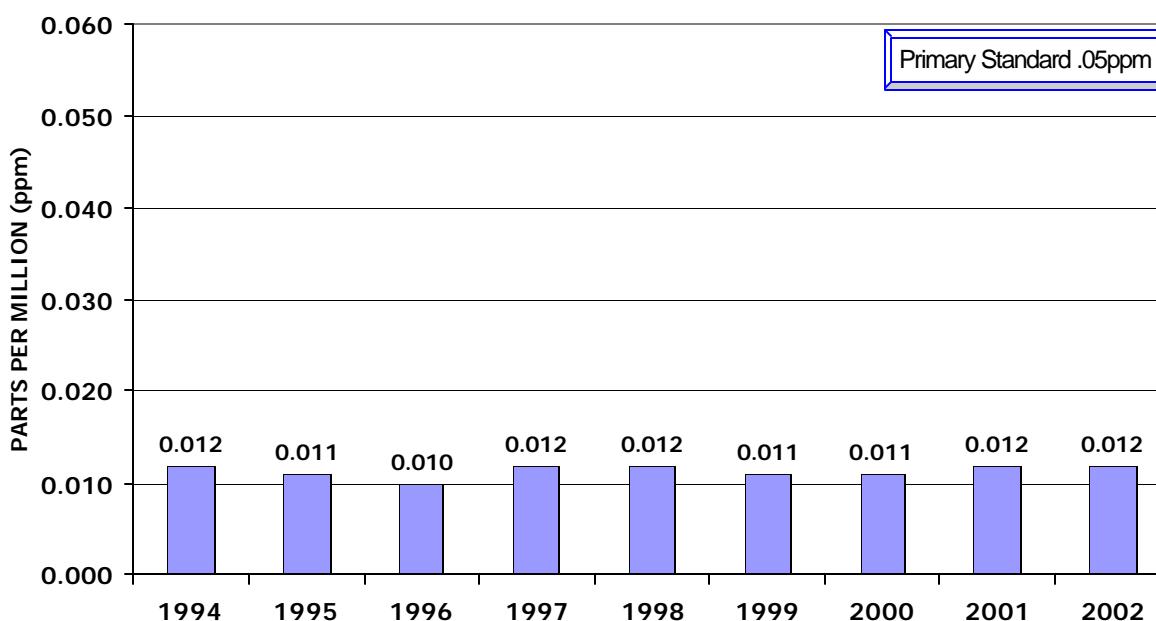
LOCATION/ STATION NO.	NO. 1-HR. OBS.	NUMBER OF 1-HOUR CONCENTRATIONS IN RANGES							>.28
		.00 to .04	.05 to .08	.09 to .12	.13 to .16	.17 to .20	.21 to .24	.25 to .28	
ALEXANDRIA									
ALEXANDRIA 517 North St. Asaph Street	L-126-C	8193	7687	506	0	0	0	0	0
FAIRFAX COUNTY									
FAIRFAX CO. 1437 Balls Hill Road	L-46-A8	6076	5955	121	0	0	0	0	0
FAIRFAX CO. 6507 Columbia Pike	L-46-C1*	5667	5520	147	0	0	0	0	
FAIRFAX CO. Upper Cub Run Sewage Treatment Plant	L-46-F	8401	8400	1	0	0	0	0	0

* New Station

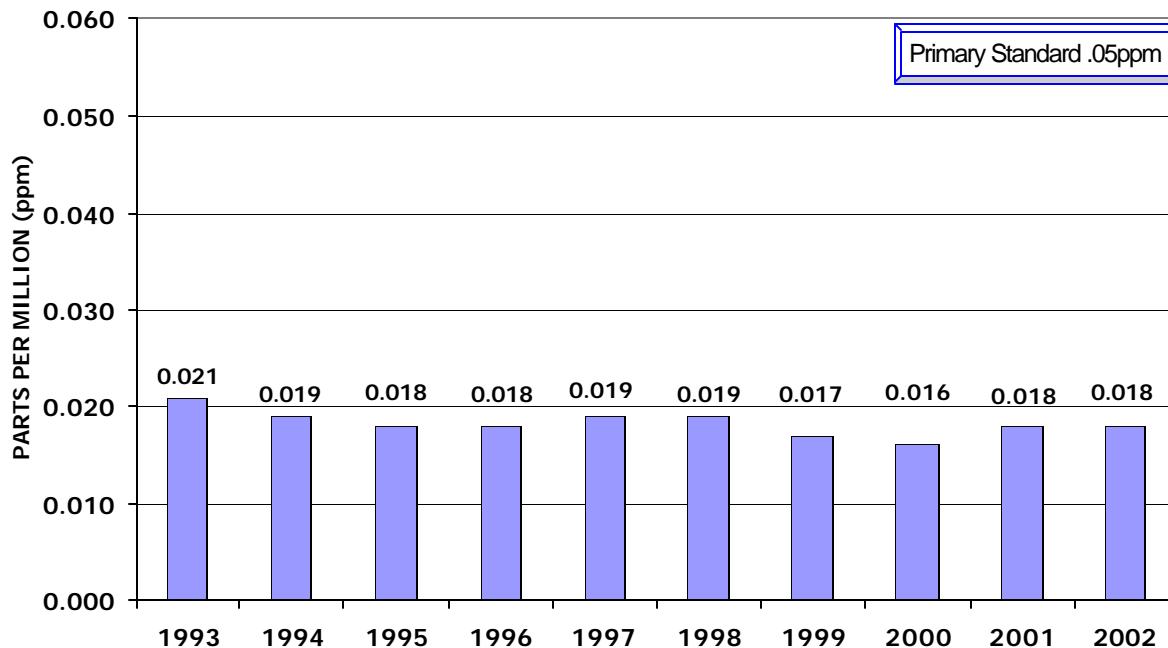
NITROGEN DIOXIDE, WEST CENTRAL REGION
ANNUAL ARITHMETIC MEAN
19-A6, Vinton Elementary School, Vinton



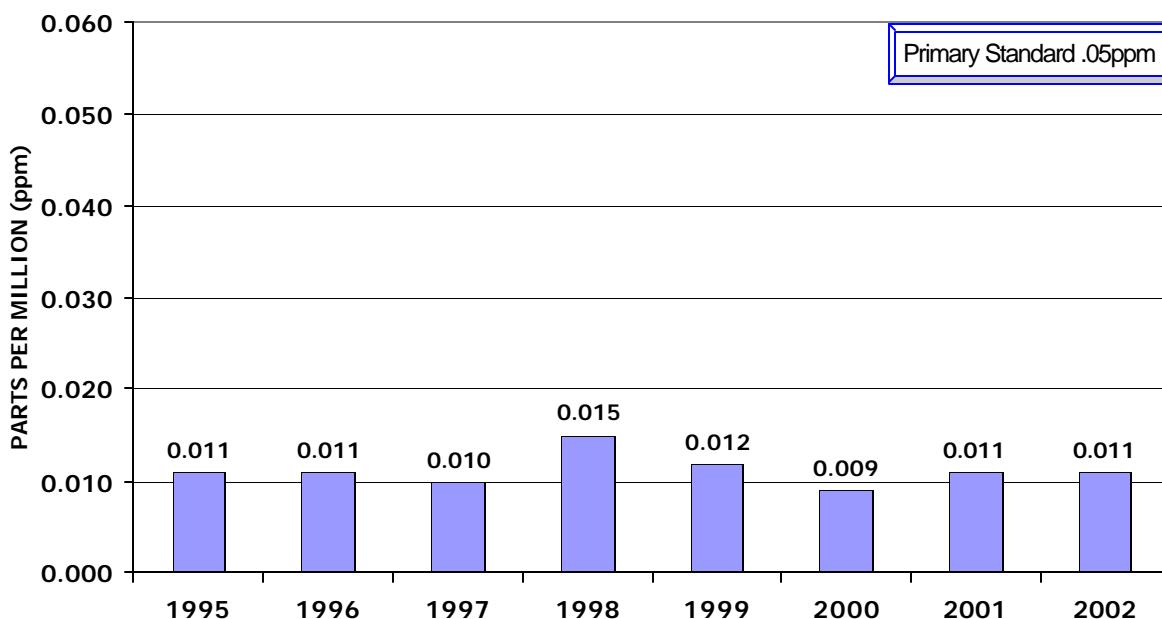
NITROGEN DIOXIDE, PIEDMONT REGION
ANNUAL ARITHMETIC MEAN
75-B, Charles City County



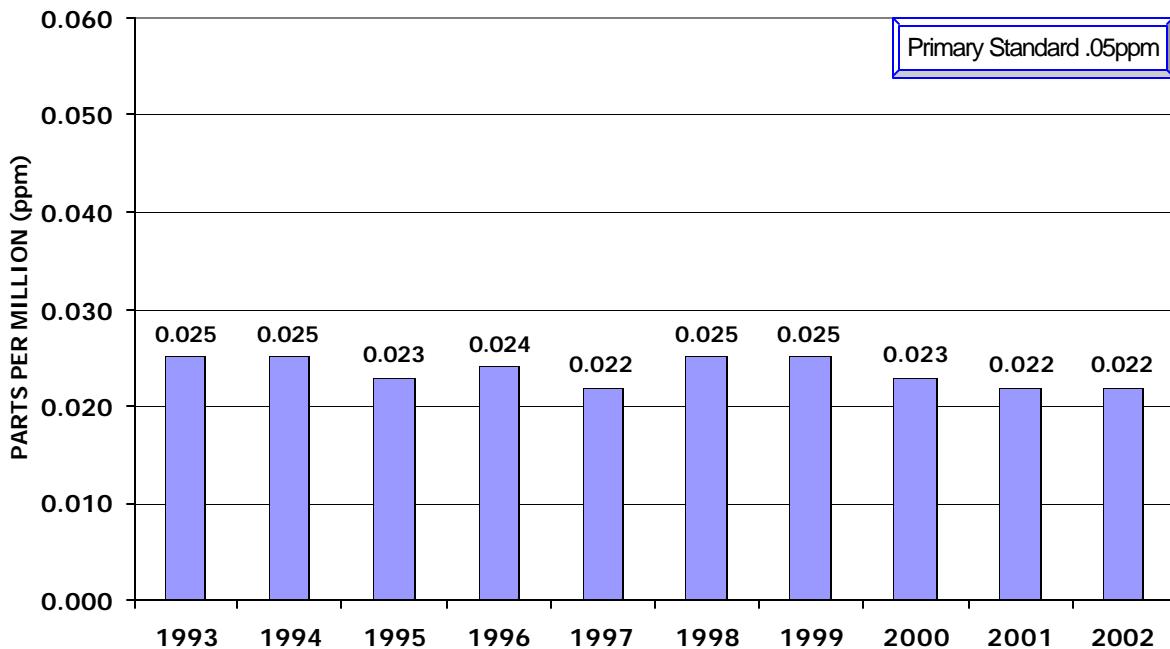
NITROGEN DIOXIDE, TIDEWATER REGION
ANNUAL ARITHMETIC MEAN
181-Z, Norfolk State University, Norfolk



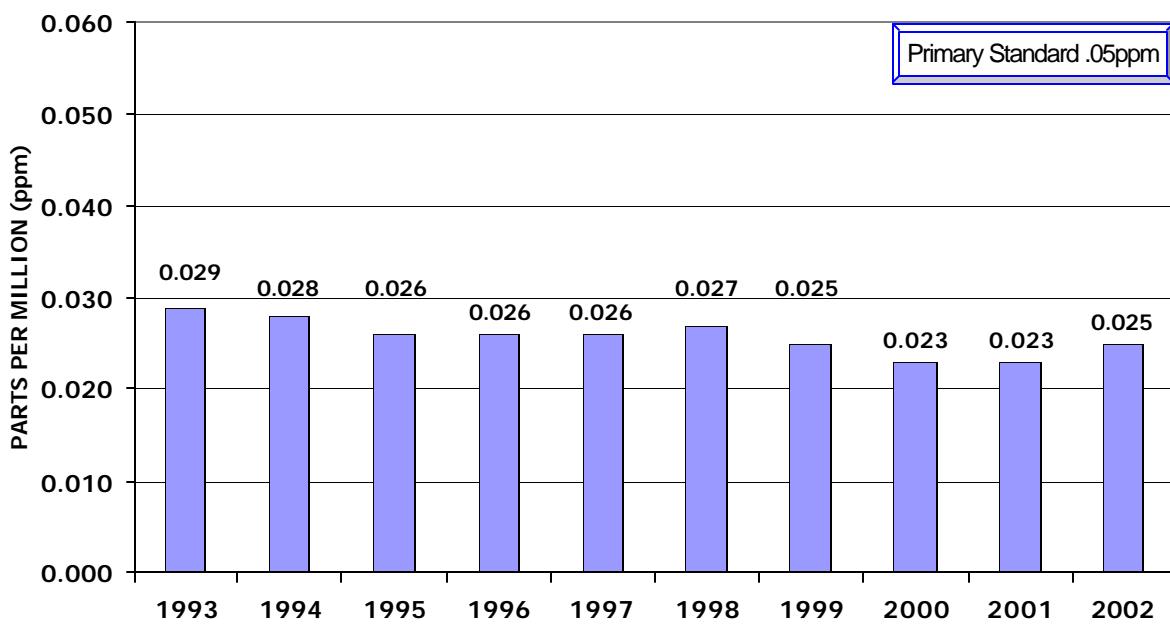
NITROGEN DIOXIDE, NORTHERN REGION
ANNUAL ARITHMETIC MEAN
45-L, Long Park, Prince William County



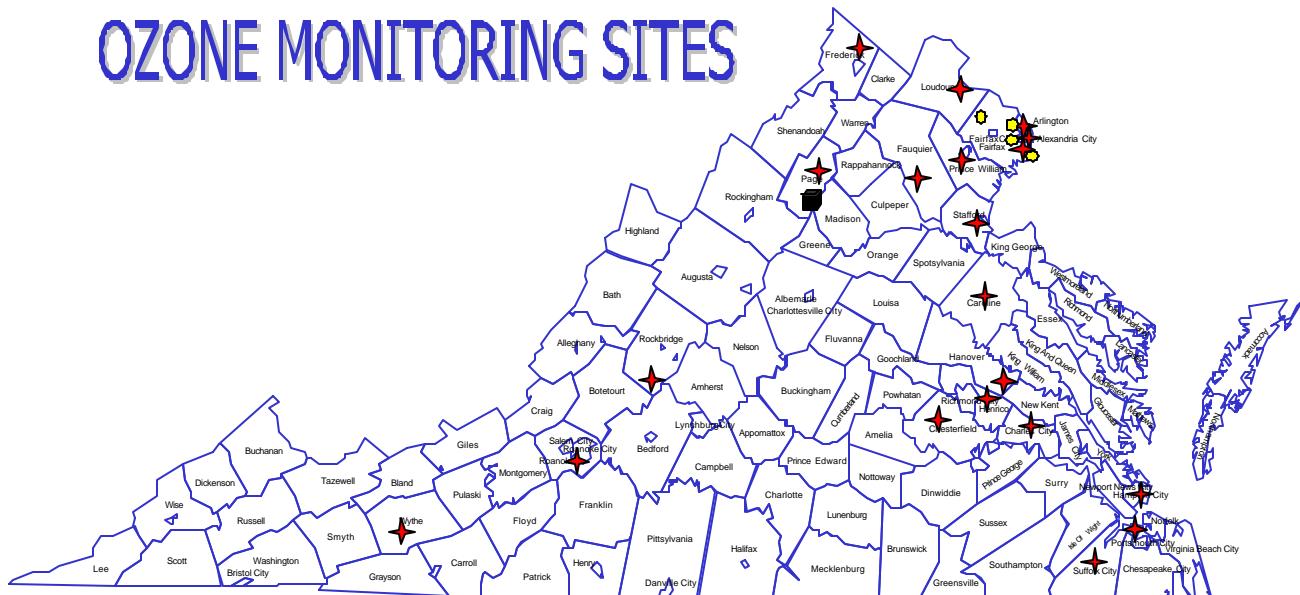
NITROGEN DIOXIDE, NORTHERN REGION
ANNUAL ARITHMETIC MEAN
47-T, Aurora Hills Visitors Center, Arlington County



NITROGEN DIOXIDE, ALEXANDRIA
ANNUAL ARITHMETIC MEAN
L-126-C, 517 North Saint Asaph Street



OZONE MONITORING SITES



Reporting Organizations

- ★ VA Department of Environmental Quality
- ★ Fairfax County Health Department
- National Park Service

OZONE (O_3) is formed by a complex series of reactions among nitrogen oxides and certain organic compounds under the influence of solar ultraviolet radiation (sunlight). Ozone shows a very strong diurnal (daily) and seasonal (April to October) cyclical character. Ozone injures vegetation, has adverse effects on materials (rubber and fabrics) and is a pulmonary irritant that affects the respiratory mucous membranes, lung tissues and respiratory functions.

Ozone is measured continuously by ultraviolet absorption photometry. Air is drawn continuously through a sample cell where narrow band ultraviolet light (254nm wavelength) passes through it. The proportion of light absorbed by ozone molecules in the air is converted into an electrical signal and recorded.

The National Park Service operated one ozone monitor in Shenandoah National Park in 2002. The data from this site may be obtained from the National Park Service or by internet at <http://www2.nature.nps.gov/ard/gas/netdata1.htm>.

Hourly ozone values for monitoring sites in the state can be viewed for the months of April to October on the DEQ web page at <http://www.deq.state.va.us/ozone>. In addition, animated ozone maps for Virginia and other parts of the United States are available at <http://www.epa.gov/airnow>.

VIRGINIA 2002
OZONE SUMMARY BY REGION
METHOD 19 - INSTRUMENTAL ULTRAVIOLET
Parts Per Million (ppm), Eastern Standard Time
Ozone Season - April through October

LOCATION/ STATION NO.	NO. 8-HR OBS.	FOUR HIGHEST DAILY MAXIMUM 8-HOUR AVERAGE VALUES								DAYS >.08
		1ST MAX	DATE	2ND MAX	DATE	3RD MAX	DATE	4TH MAX	DATE	
SOUTHWEST REGION										
WYTHE CO. Rural Retreat Sewage Disposal	16-B 5121	.093	AUG 10	.087	AUG 13	.086	JUL 9	.085	MAY 24	6
VALLEY REGION										
ROCKBRIDGE CO. Natural Bridge Ranger Station	21-C 5120	.083	AUG 11	.080	JUN 11	.080	AUG 23	.078	AUG 10	0
FREDERICK CO. Rest	28-J 5119	.097	SEP 10	.093	JUL 2	.092	AUG 11	.091	AUG 13	9
PAGE CO. Luray Caverns Airport	29-D 5109	.099	SEP 10	.083	AUG 11	.083	SEP 13	.079	AUG 14	1
WEST CENTRAL REGION										
ROANOKE CO. East Vinton Elementary Sch.	19-A6 5120	.099	AUG 13	.094	JUL 17	.092	AUG 11	.091	JUN 11	5
PIEDMONT REGION										
CHARLES CITY CO. Route 608	75-B 4619	.120	JUL 17	.117	AUG 13	.105	JUN 10	.105	JUL 2	16
CHESTERFIELD CO. Beach Road	71-H 5031	.112	JUL 2	.101	AUG 2	.094	JUL 3	.093	AUG 1	9
HENRICO CO. Math and Science Center	72-M 4825	.125	AUG 13	.106	AUG 12	.103	JUN 10	.098	JUL 17	11

VIRGINIA 2002
OZONE SUMMARY BY REGION
METHOD 19 AND 47 - INSTRUMENTAL ULTRAVIOLET
Parts Per Million (ppm), Eastern Standard Time
Ozone Season - April through October

LOCATION/ STATION NO.	NO. 8-HR OBS.	FOUR HIGHEST DAILY MAXIMUM 8-HOUR AVERAGE VALUES								DAYS >.08
		1ST MAX	DATE	2ND MAX	DATE	3RD MAX	DATE	4TH MAX	DATE	
TIDEWATER REGION										
HAMPTON Virginia School	179-C	5074	.117	JUL 17	.106	JUL 4	.103	AUG 23	.102	AUG 13
SUFFOLK Tidewater Comm. College	183-E	5120	.111	JUL 4	.105	JUL 17	.098	JUL 3	.098	JUL 16
SUFFOLK Tidewater Research Station	183-F	5013	.102	JUL 17	.097	AUG 23	.096	AUG 13	.092	JUL 16
NORTHERN REGION										
ARLINGTON CO. Aurora Hills Visitors Center	47-T	5121	.133	JUL 2	.120	JUN 25	.114	AUG 12	.112	AUG 2
CAROLINE CO. U.S.G.S. Geomagnetic Center	48-A	4860	.099	AUG 13	.090	AUG 14	.086	AUG 1	.085	SEP 9
FAIRFAX CO. Lee District Park	46-B9	5116	.128	AUG 13	.125	JUL 2	.110	AUG 12	.108	JUN 10
FAUQUIER CO. Phelps Wildlife Area	37-B	4990	.090	SEP 9	.089	AUG 13	.085	AUG 2	.084	AUG 12
LOUDOUN CO. Broad Run High School	38-I	5127	.119	SEP 10	.105	JUL 2	.103	JUN 25	.102	AUG 11

VIRGINIA 2002
OZONE SUMMARY BY REGION
METHOD 19 - INSTRUMENTAL ULTRAVIOLET
Parts Per Million (ppm), Eastern Standard Time
Ozone Season - April through October

LOCATION/ STATION NO.	NO. 8-HR OBS.	FOUR HIGHEST DAILY MAXIMUM 8-HOUR AVERAGE VALUES								DAYS >.08	
		1ST MAX	DATE	2ND MAX	DATE	3RD MAX	DATE	4TH MAX	DATE		
NORTHERN REGION (CONT.)											
PRINCE WILLIAM CO. Long Park	45-L	4969	.108	SEP 10	.093	AUG 11	.089	JUN 24	.087	JUN 21	7
STAFFORD CO. Widewater Elementary School	44-A	5114	.126	AUG 13	.108	AUG 1	.094	JUN 25	.094	AUG 12	12
ALEXANDRIA 517 North Saint Asaph Street	L-126-C	5096	.123	JUL 2	.110	JUN 25	.107	AUG 13	.103	AUG 2	10
FAIRFAX CO. HEALTH DEPT.											
FAIRFAX CO. 1437 Balls Hill Road	L-46-A8	6696	.104	AUG 2	.101	JUL 2	.100	AUG 12	.099	AUG 11	7
FAIRFAX CO. 2675 Sherwood Hall Lane	L-46-B3	5092	.127	JUL 2	.125	AUG 13	.107	AUG 12	.106	AUG 2	16
FAIRFAX CO. Mason Governmental Center	L-46-C1*	4902	.122	JUL 2	.112	AUG 2	.110	AUG 12	.108	AUG 13	20
FAIRFAX CO. Upper Cub Run Sewage Treatment Plant	L-46-F	7262	.099	JUN 25	.098	AUG 2	.095	AUG 12	.092	AUG 13	12

* New Station

1995-2002
VIRGINIA'S 4TH HIGHEST OZONE 8-HOUR AVERAGE
Parts Per Million (ppm)

LOCATION	STATION NUMBER	1995	1996	1997	1998	1999	2000	2001	2002
WYTHE CO. , Rural Retreat	16-B	.080	.076	.080	.087	.085	.082	.076	.085
ROCKBRIDGE CO. , Natural Bridge Ranger Station	21-C	--	--	--	--	.081	.077	.082	.078
FREDERICK CO. , Rest	28-J	.085	.080	.088	.098	.085	.079	.086	.091
PAGE CO. , Luray Caverns Airport	29-D	--	--	--	--	.086	.076	.086	.079
ROANOKE CO. , East Vinton Elementary School	19-A6	.079	.073	.084	.099	.089	.081	.089	.091
HANOVER CO. , McClellan Road	73-E	--	--	--	--	--	--	.091	.106
CHESTERFIELD CO. , Beach Road	71-H	.090	.083	.090	.090	.093	.080	.086	.093
HENRICO CO. , Math & Science Center	72-M	.089	.084	.098	.096	.096	.083	.091	.098
CHARLES CITY CO. , Route 608	75-B	.088	.084	.100	.092	.097	.076	.089	.105
HAMPTON , Virginia School	179-C	.082	.083	.097	.090	.097	.081	.085	.102
SUFFOLK , Tidewater Community College	183-E	.082	.075	.091	.087	.094	.081	.085	.098
SUFFOLK , Holland	183-F	.086	.074	.088	.087	.091	.084	.075	.092
FAUQUIER CO. , Phelps Wildlife Area	37-B	.082	.078	.083	.093	.088	.077	.082	.084
LOUDOUN CO. , Broad Run High School	38-I	--	--	--	.102	.090	.077	.093	.102
STAFFORD CO. , Widewater Elementary School	44-A	.088	.081	.091	.092	.092	.079	.086	.094
PRINCE WILLIAM CO. , Long Park	45-L	.097	.082	.086	.098	.089	.079	.089	.087

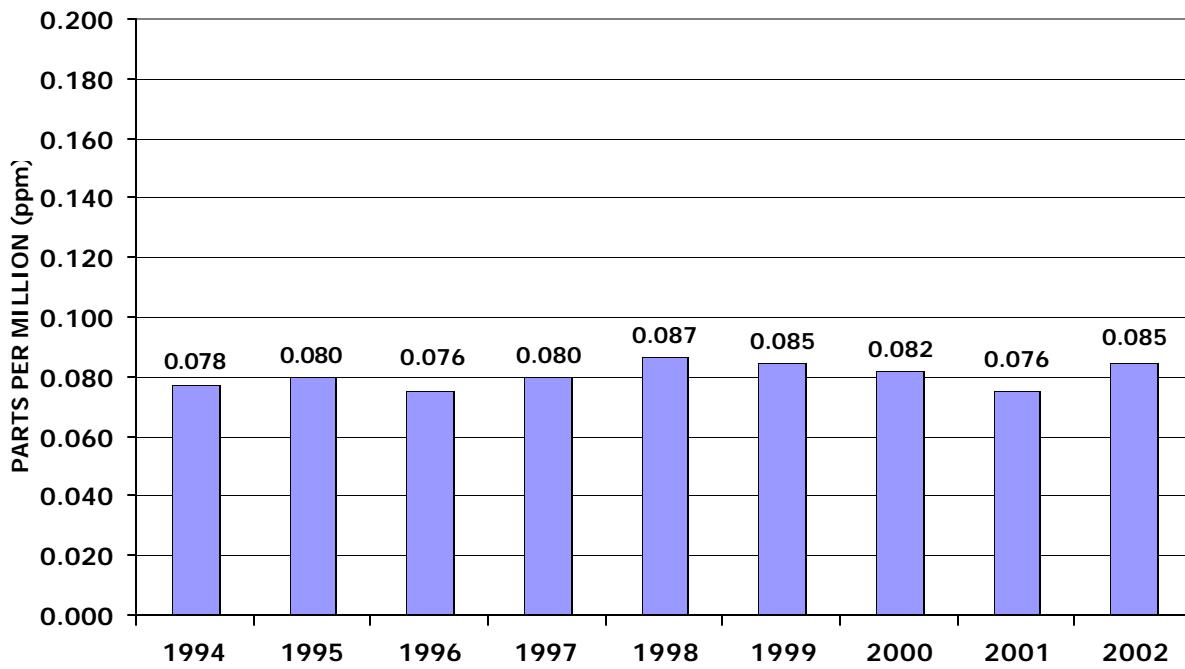
1995-2002
VIRGINIA'S 4TH HIGHEST OZONE 8-HOUR AVERAGE
Parts Per Million (ppm)

LOCATION	STATION NUMBER	1995	1996	1997	1998	1999	2000	2001	2002
FAIRFAX CO. , Lee District Park	46-B9	--	--	--	.097	.099	.070	.096	.108
ARLINGTON CO. , Aurora Hills Visitors Center	47-T	.097	.084	.094	.098	.100	.080	.098	.112
CAROLINE CO. , Corbin	48-A	.082	.080	.091	.095	.091	.078	.086	.085
ALEXANDRIA. , 517 N. St. Asaph Street	L-126-C	.090	.070**	.085	.094	.096	.077	.091	.103
FAIRFAX CO. , 1437 Balls Hill Road, McLean	L-46-A8	.097	.077	.080	.090	.087	.082	.090	.099
FAIRFAX CO. , Mount Vernon	L-46-B3	.099	.089	.088	.101	.100	.092	.095	.106
FAIRFAX CO. , Mason Govt. Center	L-46-C1*	--	--	--	--	--	--	--	.108
FAIRFAX CO. , Upper Cub Run, Chantilly	L-46-F	.093	.079	.079	.103	.092	.079	.093	.092

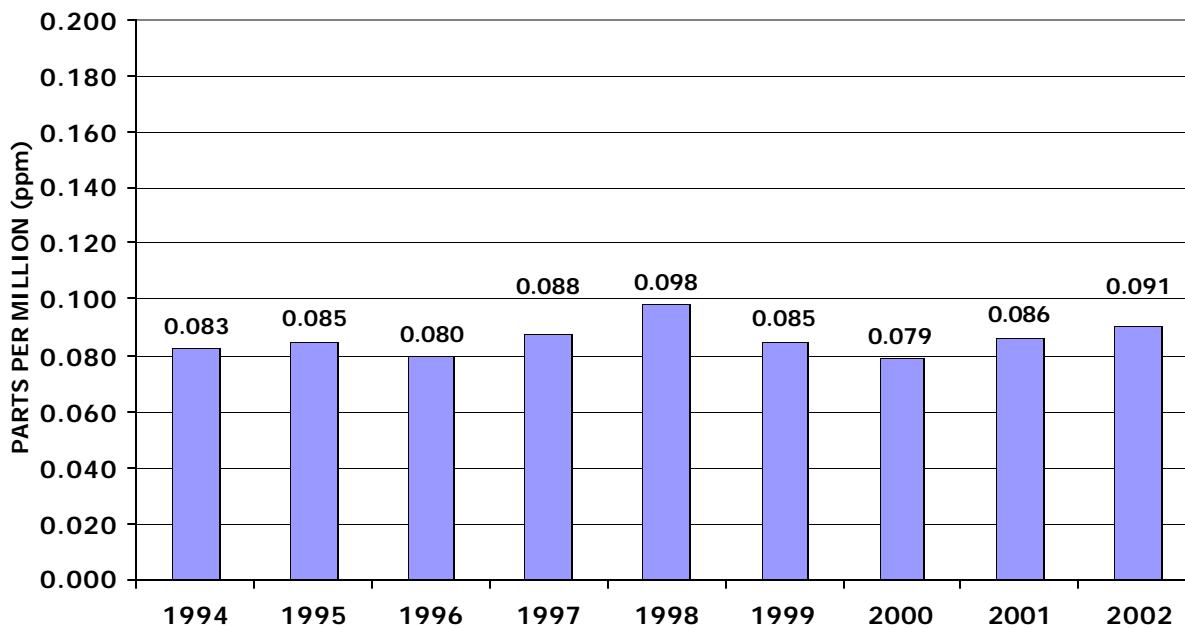
* New Station

** Did not meet EPA's minimum data capture requirements.

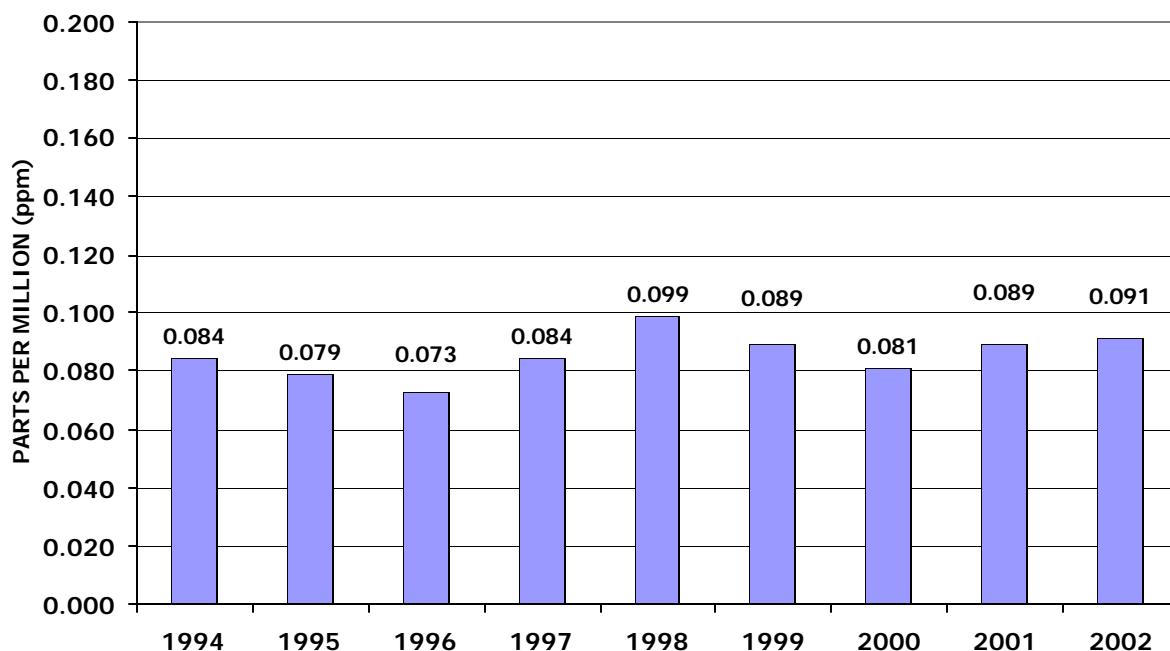
OZONE, SOUTHWEST REGION
4TH DAILY MAXIMUM, 8-HOUR VALUE
16-B, Rural Retreat, Wythe County



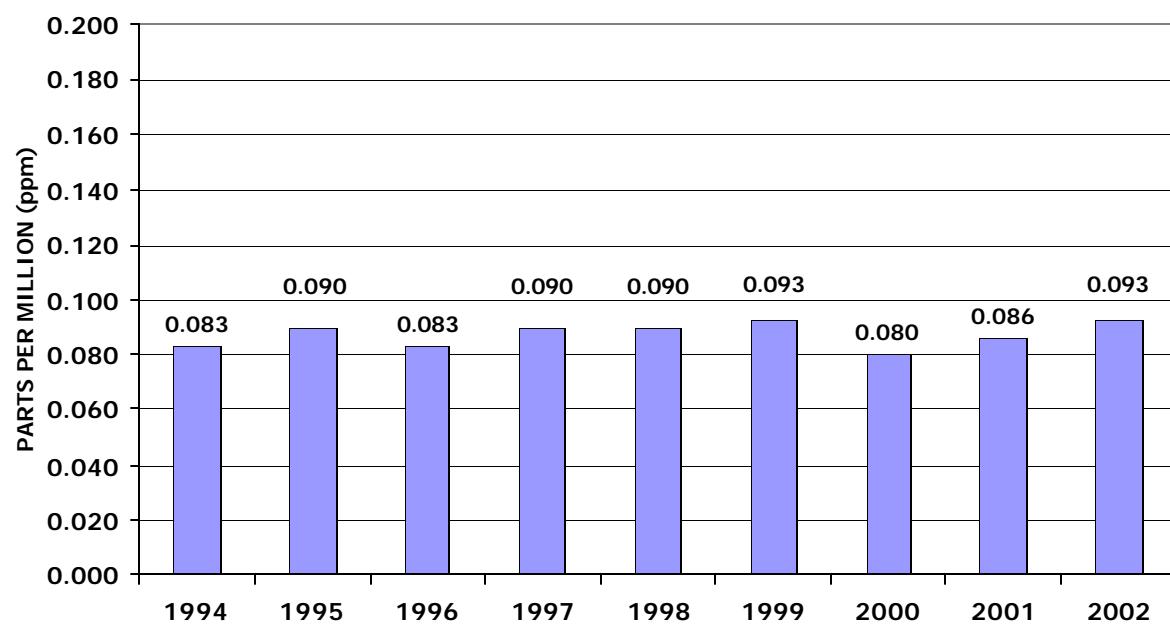
OZONE, VALLEY REGION
4TH DAILY MAXIMUM, 8-HOUR VALUE
28-J, Rest, Frederick County



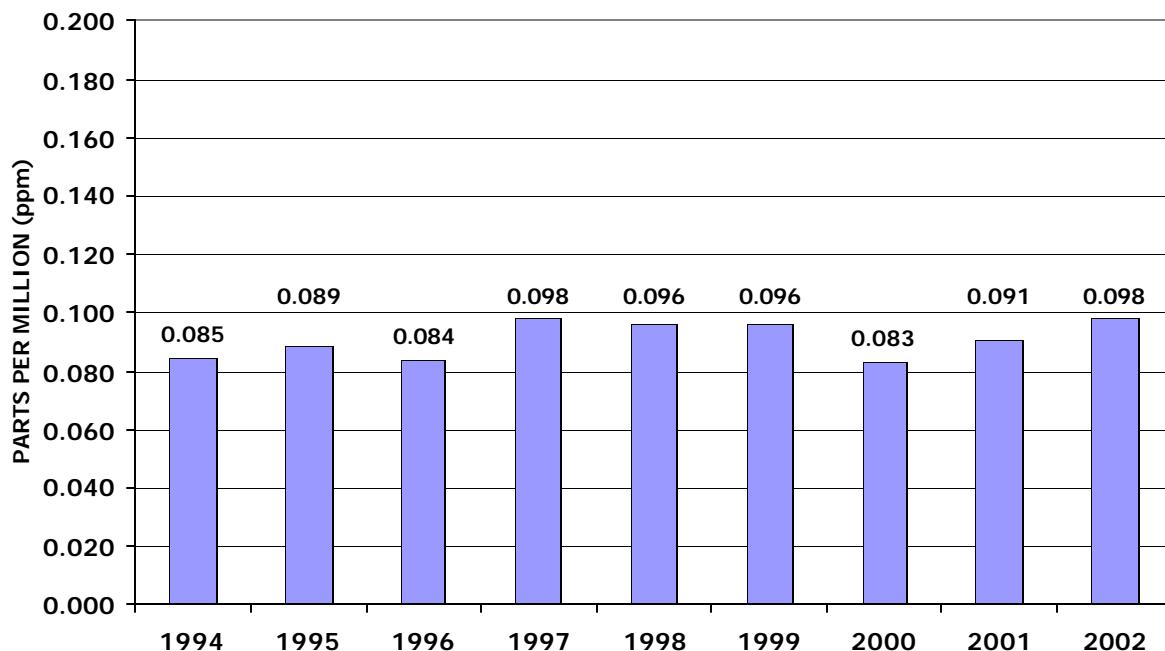
OZONE, WEST CENTRAL REGION
4TH DAILY MAXIMUM, 8-HOUR VALUE
19-A6, Vinton Elementary School, Roanoke Co.



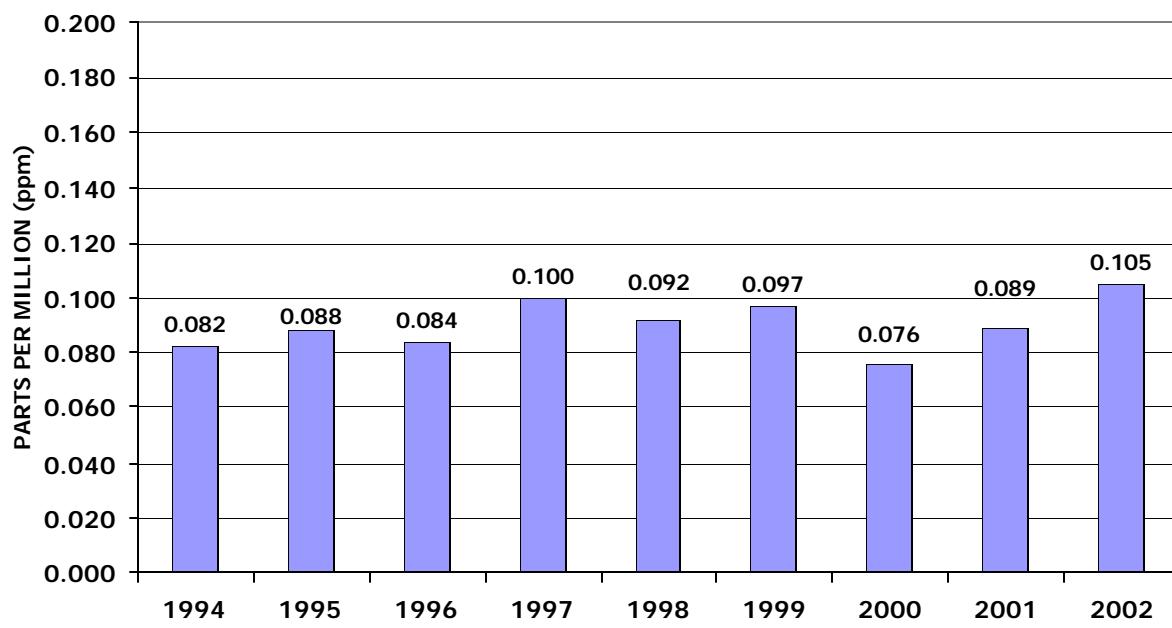
OZONE, PIEDMONT REGION
4TH DAILY MAXIMUM, 8-HOUR VALUE
71-H, Beach Road, Chesterfield County



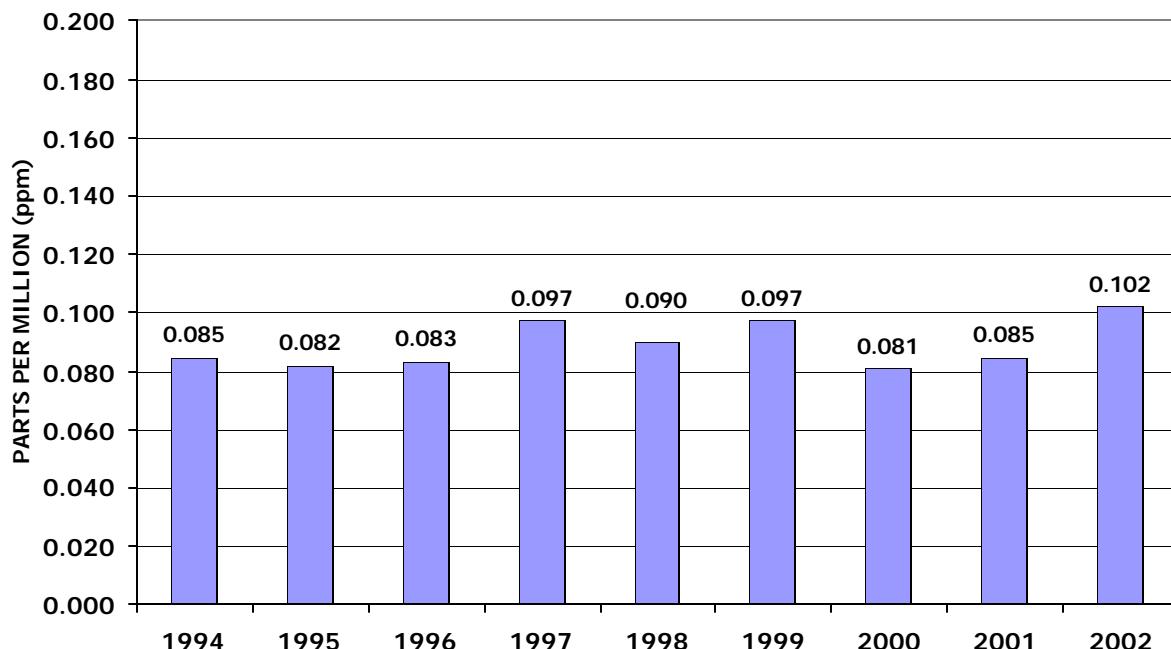
OZONE, PIEDMONT REGION
4TH DAILY MAXIMUM, 8-HOUR VALUE
72-M, Math & Science Center, Henrico County



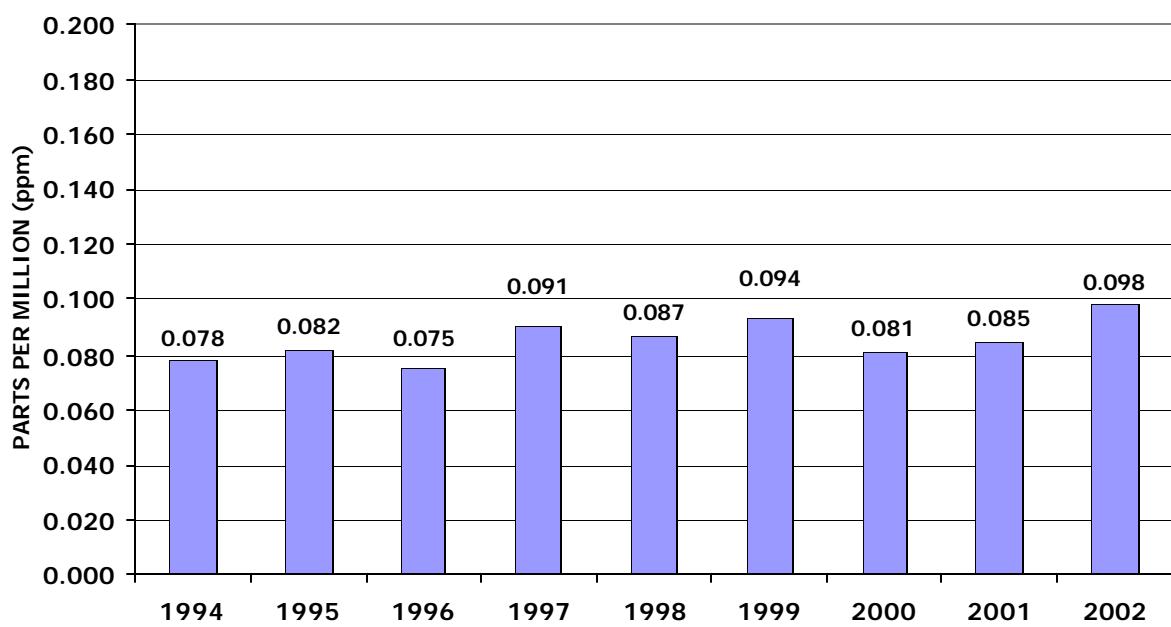
OZONE, PIEDMONT REGION
4TH DAILY MAXIMUM, 8-HOUR VALUE
75-B, Route 608, Charles City County



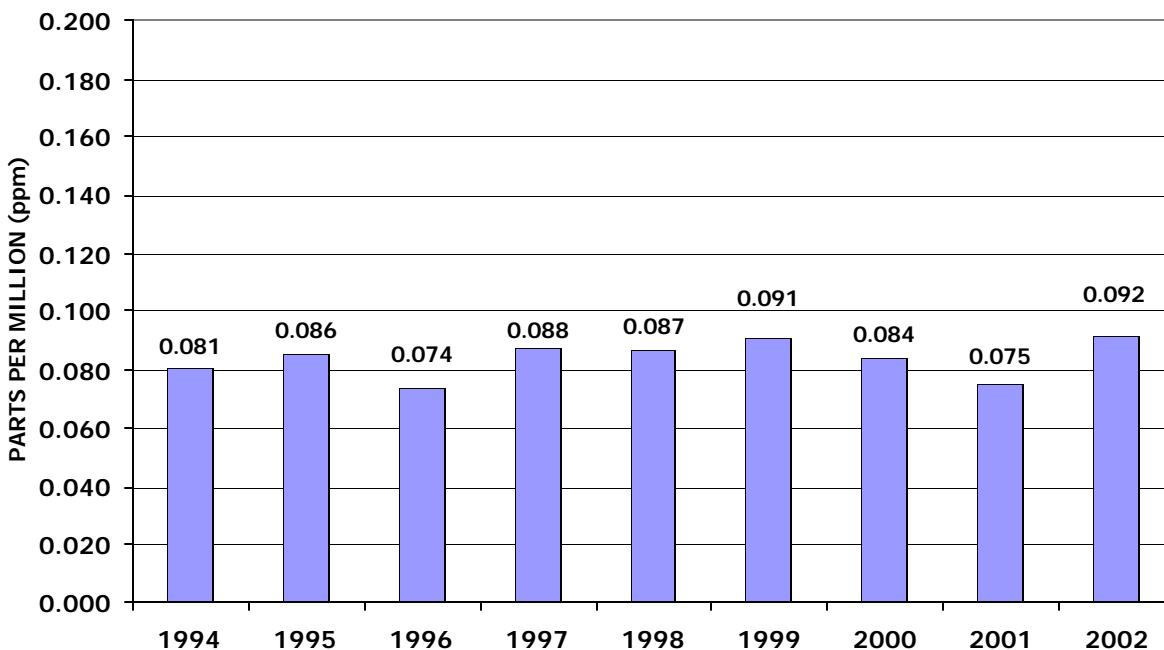
OZONE, TIDEWATER REGION
4TH DAILY MAXIMUM, 8-HOUR VALUE
179-C, Virginia School, Hampton



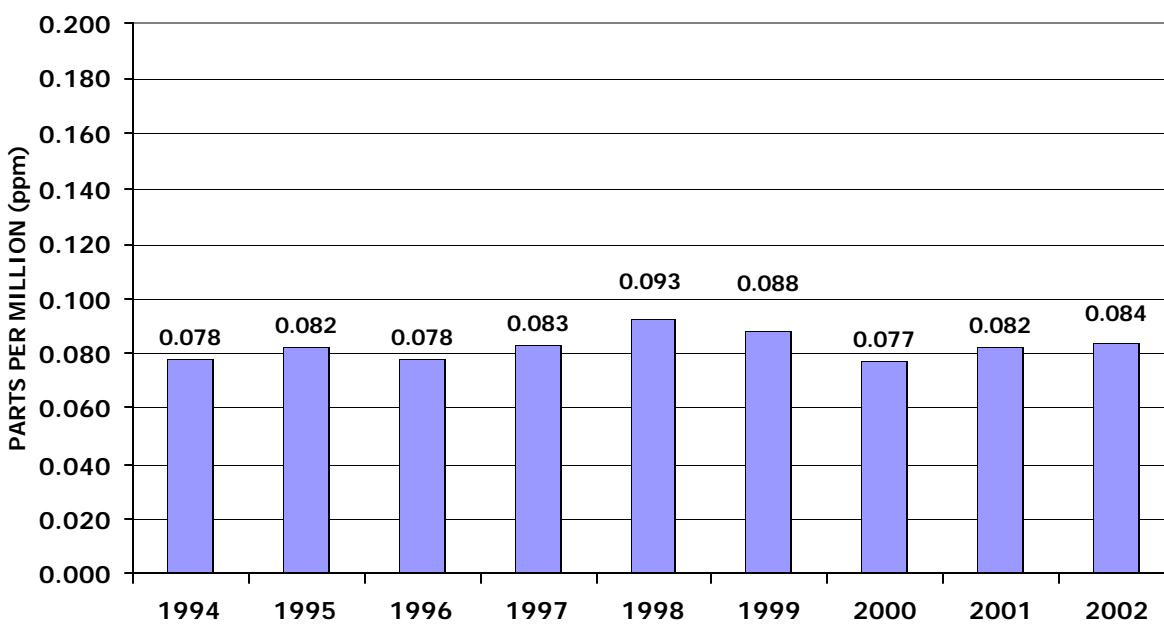
OZONE, TIDEWATER REGION
4TH DAILY MAXIMUM, 8-HOUR VALUE
183-E, Tidewater Community College, Suffolk



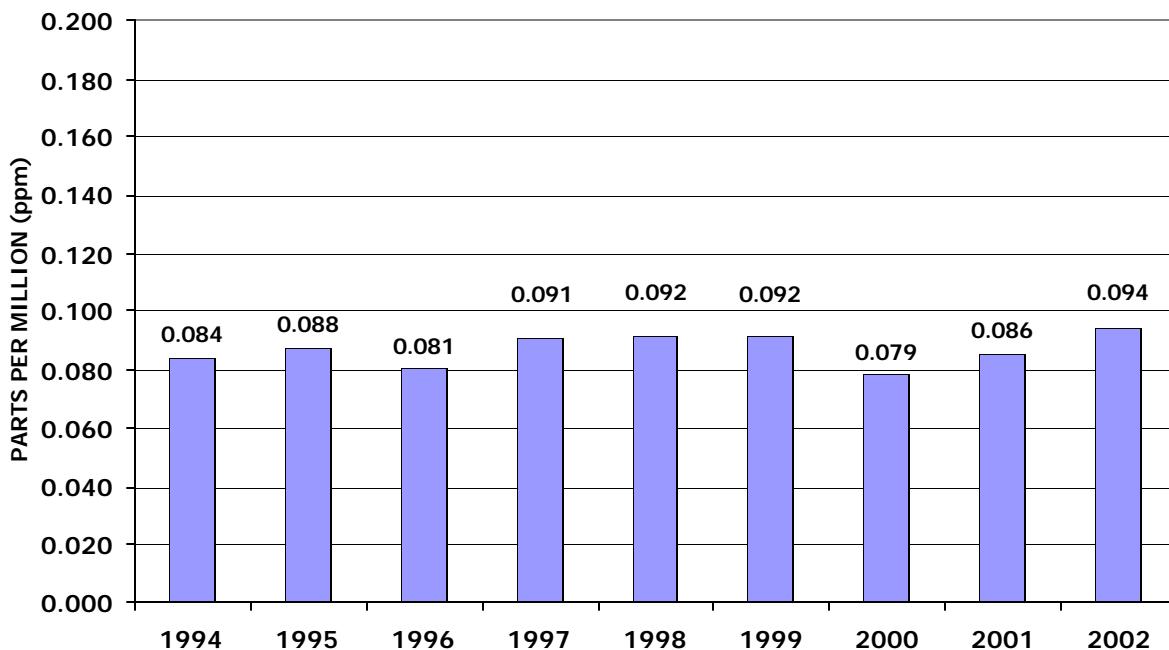
OZONE, TIDEWATER REGION
4TH DAILY MAXIMUM, 8-HOUR VALUE
183-F, Holland, Suffolk



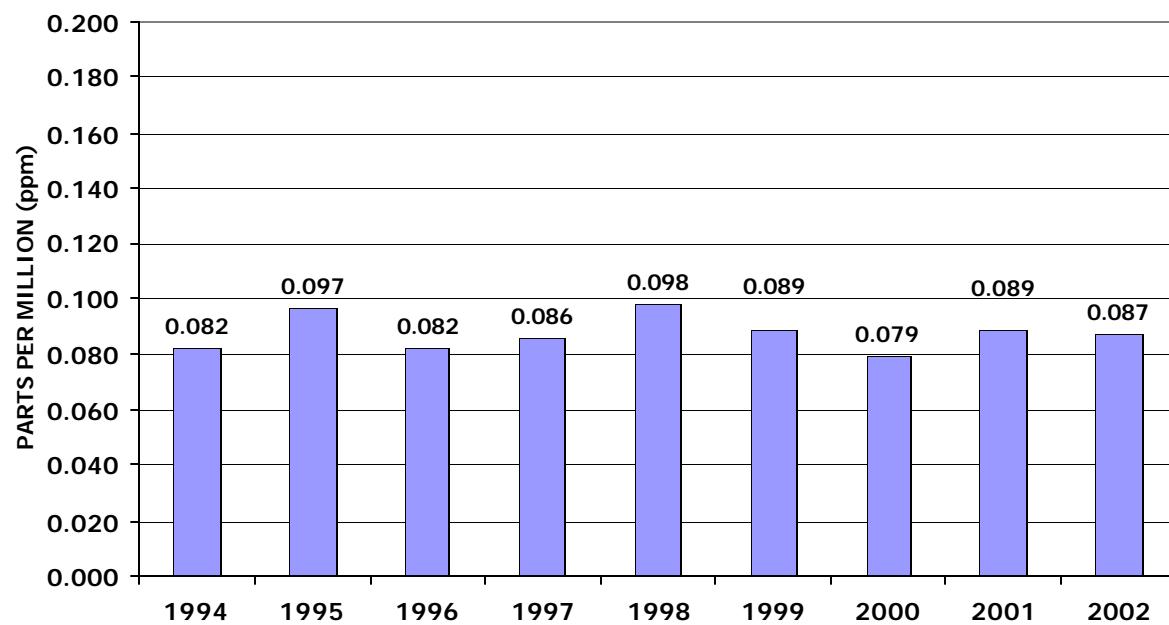
OZONE, NORTHERN REGION
4TH DAILY MAXIMUM, 8-HOUR VALUE
37-B, Phelps Wildlife Area, Fauquier County



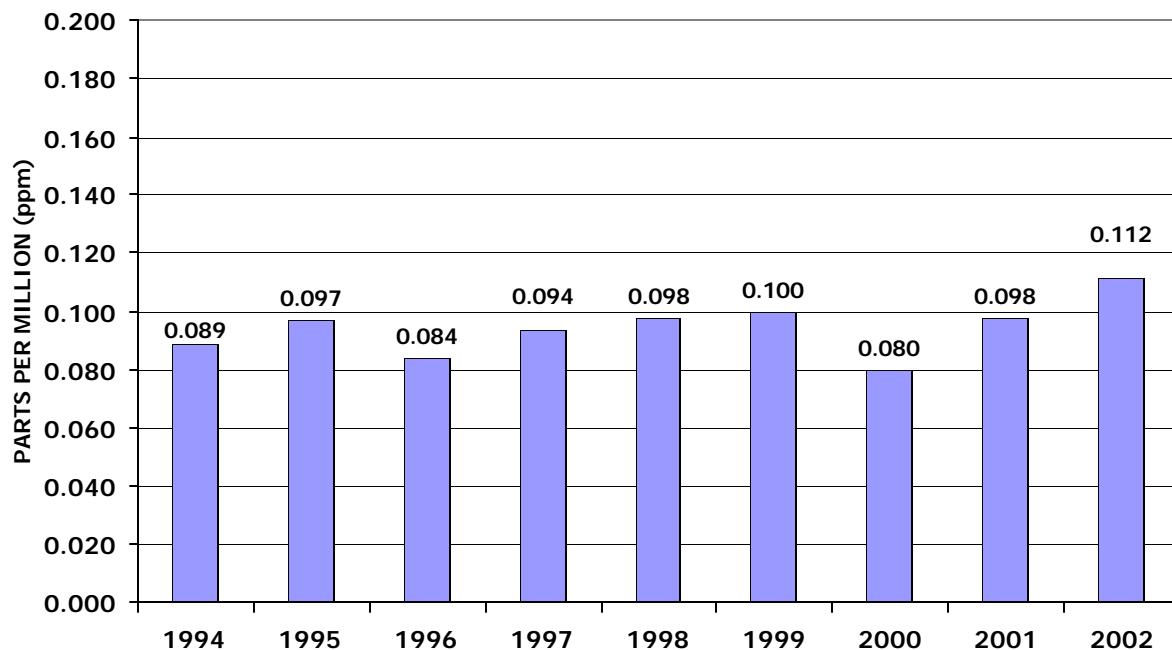
OZONE, NORTHERN REGION
4TH DAILY MAXIMUM, 8-HOUR VALUE
44-A, Widewater Elementary School, Stafford County



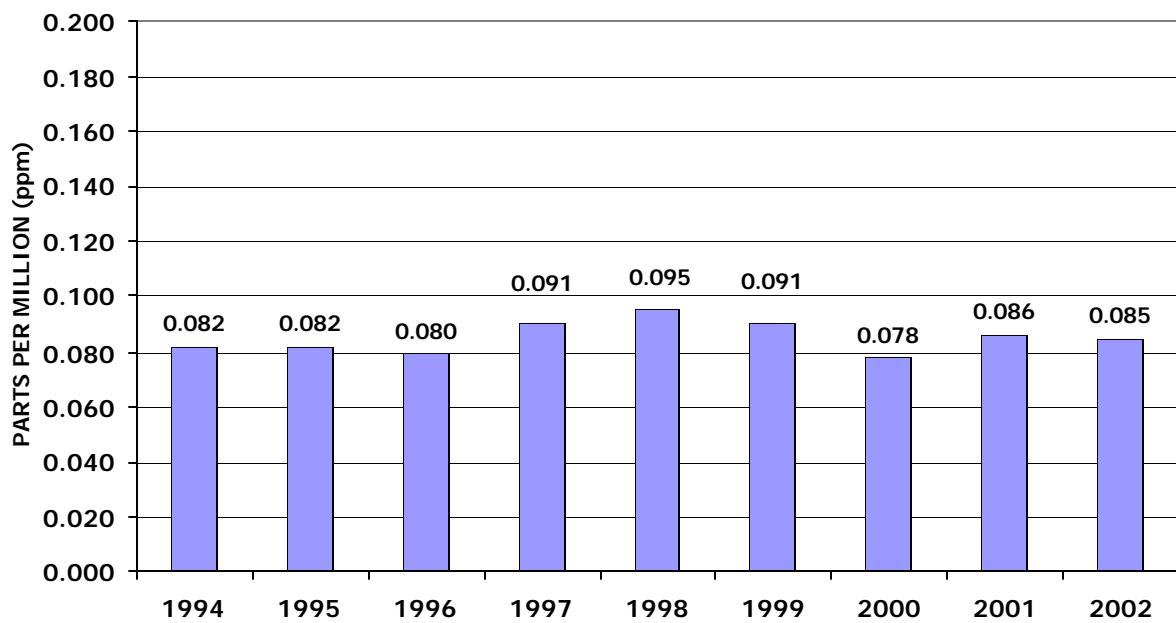
OZONE, NORTHERN REGION
4TH DAILY MAXIMUM, 8-HOUR VALUE
45-L, Long Park, Prince William County



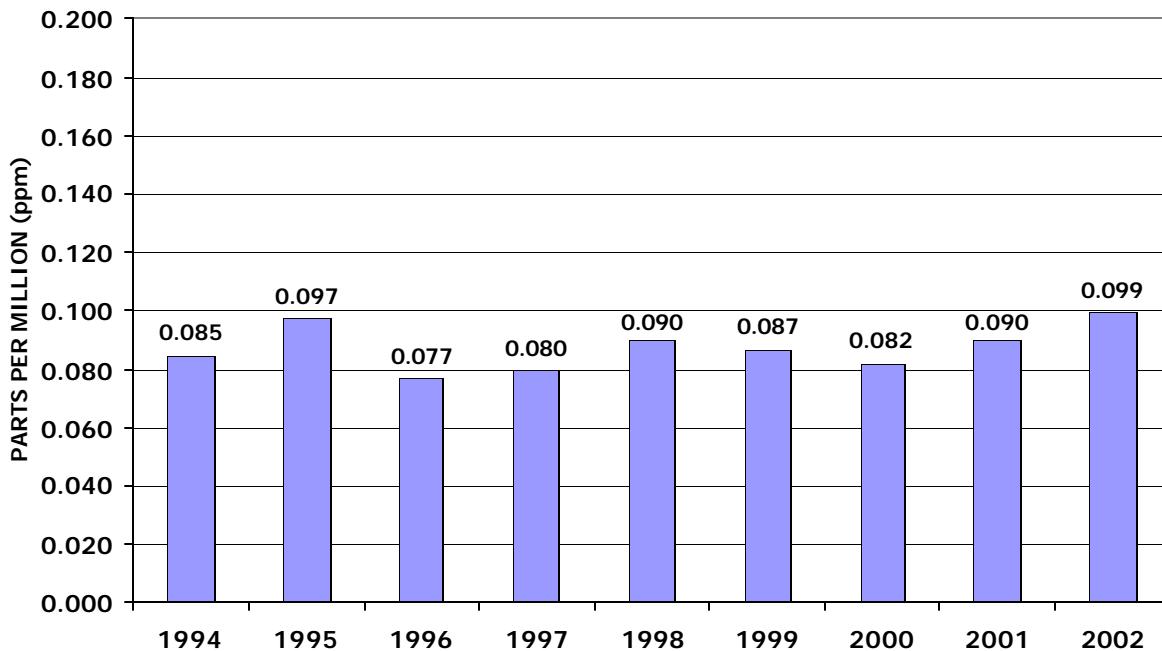
OZONE, NORTHERN REGION
4TH DAILY MAXIMUM, 8-HOUR VALUE
47-T, Aurora Hills Visitors Center, Arlington County



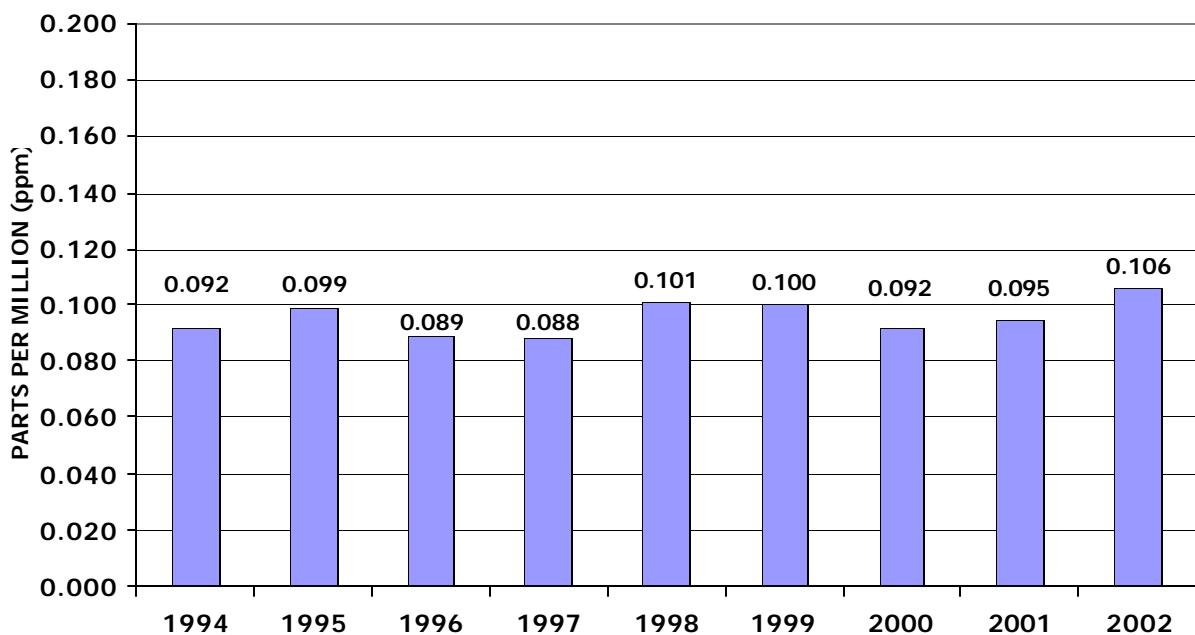
OZONE, NORTHERN REGION
4TH DAILY MAXIMUM, 8-HOUR VALUE
48-A, Corbin, Caroline County



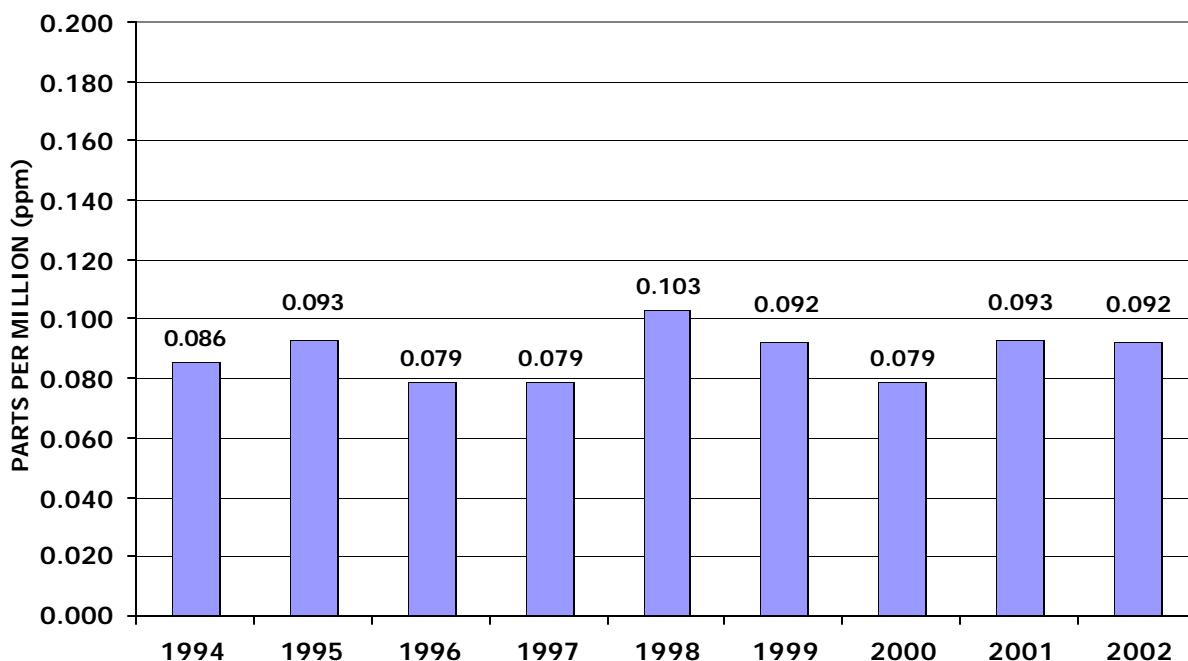
OZONE, FAIRFAX COUNTY
4TH DAILY MAXIMUM, 8-HOUR VALUE
L-46-A8, 1437 Balls Hill Road, McLean



OZONE, FAIRFAX COUNTY
4TH DAILY MAXIMUM, 8-HOUR VALUE
L-46-B3, 2675 Sherwood Hall Lane, Mt. Vernon



OZONE, FAIRFAX COUNTY
4TH DAILY MAXIMUM, 8-HOUR VALUE
L-46-F, Upper Cub Run Drive, Chantilly



VIRGINIA 2002
OZONE SUMMARY BY REGION
METHOD 19 - INSTRUMENTAL ULTRAVIOLET
Parts Per Million (ppm)
Ozone Season - April through October

LOCATION/ STATION NO.	NO. 1-HR OBS.	FOUR HIGHEST DAILY MAXIMUM HOURLY VALUES								DAYS >.12
		1ST MAX	DATE TIME	2ND MAX	DATE TIME	3RD MAX	DATE TIME	4TH MAX	DATE TIME	
SOUTHWEST REGION										
WYTHE CO. Rural Retreat Sewage Disposal	16-B	5063	.100	AUG 10 NOON	.094	AUG 13 11:00 AM	.093	MAY 25 9:00 AM	.092	JUL 9 3:00 PM
VALLEY REGION										
ROCKBRIDGE CO. Natural Bridge	21-C	5079	.087	JUN 11 2:00 PM	.086	JUL 8 2:00 PM	.086	AUG 11 11:00 AM	.085	JUL 3 1:00 PM
FREDERICK CO. Rest	28-J	5057	.116	AUG 13 3:00 PM	.113	SEP 10 1:00 PM	.108	JUN 25 NOON	.105	JUL 2 2:00 PM
PAGE CO. Luray Caverns Airport	29-D	5051	.109	SEP 10 3:00 PM	.090	AUG 12 NOON	.089	SEP 13 5:00 PM	.088	JUL 17 5:00 PM
WEST CENTRAL REGION										
ROANOKE CO. East Vinton Elementary Sch.	19-A6	5077	.111	AUG 13 5:00 PM	.107	JUL 17 NOON	.097	JUN 11 11:00 AM	.096	AUG 11 3:00 PM
PIEDMONT REGION										
CHARLES CITY CO. Route 608	75-B	4594	.164	JUL 17 3:00 PM	.137	AUG 13 NOON	.131	JUN 10 3:00 PM	.124	JUN 12 3:00 PM
CHESTERFIELD CO. Beach Road	71-H	4987	.140	JUL 2 5:00 PM	.120	AUG 2 1:00 PM	.109	JUL 3 2:00 PM	.107	AUG 1 1:00 PM
HENRICO CO. Math & Science Center	72-M	4791	.140	AUG 13 3:00 PM	.121	JUL 17 2:00 PM	.118	AUG 12 NOON	.117	JUN 10 5:00 PM
HANOVER CO. McClellan Road	73-E	5052	.133	AUG 12 4:00 PM	.122	JUN 11 NOON	.122	AUG 13 NOON	.121	JUL 18 NOON

-901-

VIRGINIA 2002
OZONE SUMMARY BY REGION
METHOD 19 AND 47 - INSTRUMENTAL ULTRAVIOLET
Parts Per Million (ppm)
Ozone Season - April through October

LOCATION/ STATION NO.	NO. 1-HR OBS.	FOUR HIGHEST DAILY MAXIMUM HOURLY VALUES								DAYS >.12
		1ST MAX	DATE TIME	2ND MAX	DATE TIME	3RD MAX	DATE TIME	4TH MAX	DATE TIME	
TIDEWATER REGION										
HAMPTON Virginia School	179-C	5020	.134	JUL 17 5:00 PM	.128	AUG 13 2:00 PM	.121	AUG 12 1:00 PM	.117	JUL 4 3:00 PM
SUFFOLK Tidewater Comm. College	183-E	5079	.125	JUL 4 11:00 AM	.120	JUL 16 4:00 PM	.116	JUL 17 3:00 PM	.116	AUG 13 2:00 PM
SUFFOLK Tidewater Research Station	183-F	4984	.115	JUL 16 2:00 PM	.111	JUL 17 4:00 PM	.109	AUG 23 1:00 PM	.106	AUG 1 3:00 PM
NORTHERN REGION										
ARLINGTON CO. Aurora Hills Visitors Center	47-T	5063	.151	JUL 2 3:00 PM	.149	JUN 25 2:00 PM	.139	AUG 2 1:00 PM	.131	AUG 12 5:00 PM
CAROLINE CO. U.S.G.S. Geomagnetic Center	48-A	4830	.115	AUG 13 2:00 PM	.106	JUL 17 3:00 PM	.101	AUG 1 4:00 PM	.100	AUG 14 1:00 PM
FAUQUIER CO. Phelps Wildlife Area	37-B	4943	.102	AUG 2 3:00 PM	.102	SEP 9 4:00 PM	.098	AUG 13 1:00 PM	.094	JUN 11 5:00 PM
LOUDOUN CO. Broad Run High School	38-I	5070	.132	SEP 10 4:00 PM	.117	JUL 2 3:00 PM	.115	JUN 25 1:00 PM	.114	AUG 11 4:00 PM
PRINCE WILLIAM CO. Long Park	45-L	4918	.129	SEP 10 4:00 PM	.113	AUG 5 2:00 PM	.104	AUG 11 4:00 PM	.099	SEP 9 3:00 PM
FRANCONIA Lee District Park	46-B9	5046	.148	AUG 13 4:00 PM	.137	JUL 2 4:00 PM	.129	AUG 2 1:00 PM	.126	JUN 25 1:00 PM
STAFFORD CO. Widewater Elementary School	44-A	5066	.149	AUG 13 2:00 PM	.119	AUG 1 2:00 PM	.111	JUN 25 NOON	.108	JUN 11 11:00 AM

VIRGINIA 2002
OZONE SUMMARY BY REGION
METHOD 19 - INSTRUMENTAL ULTRAVIOLET
Parts Per Million (ppm)
Ozone Season - April through October

LOCATION/ STATION NO.	NO. 1-HR OBS.	FOUR HIGHEST DAILY MAXIMUM HOURLY VALUES								DAYS >.12
		1ST MAX	DATE TIME	2ND MAX	DATE TIME	3RD MAX	DATE TIME	4TH MAX	DATE TIME	
ALEXANDRIA										
ALEXANDRIA 517 North Saint Asaph St.	L-126-C	5070	.145	JUL 2 4:00 PM	.143	JUN 25 1:00 PM	.127	AUG 2 1:00 PM	.124	AUG 13 2:00 PM
FAIRFAX CO.										
FAIRFAX CO. 1437 Balls Hill Road	L-46-A8	6696	.131	AUG 2 2:00 PM	.122	JUL 2 3:00 PM	.117	JUL 1 4:00 PM	.113	AUG 12 2:00 PM
FAIRFAX CO. 2675 Sherwood Hall Lane	L-46-B3	5079	.158	JUL 2 5:00 PM	.153	AUG 13 3:00 PM	.130	AUG 12 4:00 PM	.120	AUG 2 NOON
FAIRFAX CO. 6507 Columbia Pike	L-46-C1*	4907	.139	JUL 2 4:00 PM	.137	AUG 2 2:00 PM	.124	AUG 12 4:00 PM	.120	AUG 11 1:00 PM
FAIRFAX CO. Upper Cub Run Sewage Treatment Plant	L-46-F	7250	.149	AUG 2 4:00 PM	.117	JUN 25 2:00 PM	.110	SEP 10 3:00 PM	.108	AUG 12 4:00 PM

* New Station

VIRGINIA 2002
OZONE SUMMARY BY REGION
METHOD 19 - INSTRUMENTAL ULTRAVIOLET
Parts Per Million (ppm)
Ozone Season - April through October

LOCATION/ STATION NO.	NO. DAILY OBS.	NUMBER OF DAILY MAXIMUM 1-HOUR CONCENTRATIONS IN RANGES							
		.00 to .04	.05 to .08	.09 to .12	.13 to .16	.17 to .20	.21 to .24	.25 to .28	>.28
SOUTHWEST REGION									
WYTHE CO. Rural Retreat Sewage Disposal	16-B	214	36	169	9	0	0	0	0
WEST CENTRAL REGION									
ROANOKE CO. East Vinton Elementary School	19-A6	213	36	155	22	0	0	0	0
VALLEY REGION									
ROCKBRIDGE CO. Natural Bridge	21-C	213	50	157	6	0	0	0	0
FREDERICK CO. Rest	28-J	214	54	136	24	0	0	0	0
PAGE CO. Luray Caverns Airport	29-D	212	56	150	6	0	0	0	0
PIEDMONT REGION									
CHARLES CITY CO. Route 608	75-B	194	45	119	27	3	0	0	0
CHESTERFIELD CO. Beach Road	71-H	210	47	137	25	1	0	0	0
HENRICO CO. Math and Science Center	72-M	201	42	129	29	1	0	0	0
HANOVER CO. McClellan Road	73-E	213	43	134	35	1	0	0	0

VIRGINIA 2002
OZONE SUMMARY BY REGION
METHOD 19 AND 47 - INSTRUMENTAL ULTRAVIOLET
Parts Per Million (ppm)
Ozone Season - April through October

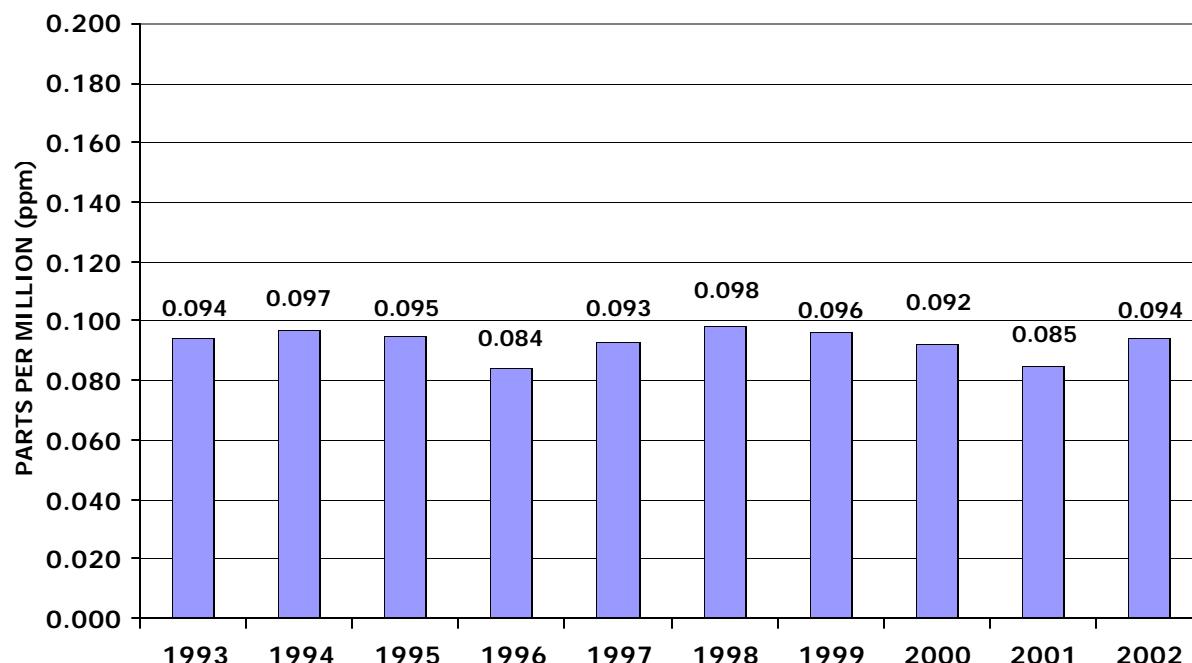
LOCATION/ STATION NO.	NO. DAILY OBS.	NUMBER OF DAILY MAXIMUM 1-HOUR CONCENTRATIONS IN RANGES							
		.00 to .04	.05 to .08	.09 to .12	.13 to .16	.17 to .20	.21 to .24	.25 to .28	>.28
TIDEWATER REGION									
HAMPTON Virginia School	179-C	212	54	131	25	2	0	0	0
SUFFOLK Tidewater Comm. College	183-E	214	50	140	23	1	0	0	0
SUFFOLK Tidewater Research Station	183-F	209	62	125	22	0	0	0	0
NORTHERN REGION									
ARLINGTON CO. Aurora Hills Fire Station	47-T	214	41	135	34	4	0	0	0
CAROLINE CO. U.S.G.S. Geomagnetic Center	48-A	202	45	144	13	0	0	0	0
FAUQUIER CO. Phelps Wildlife Area	37-B	208	54	140	14	0	0	0	0
FAIRFAX CO. Lee District Park	46-B9	213	48	127	34	4	0	0	0
LOUDOUN CO. Broad Run High School	38-I	214	36	135	42	1	0	0	0

VIRGINIA 2002
OZONE SUMMARY BY REGION
METHOD 19 - INSTRUMENTAL ULTRAVIOLET
Parts Per Million (ppm)
Ozone Season - April through October

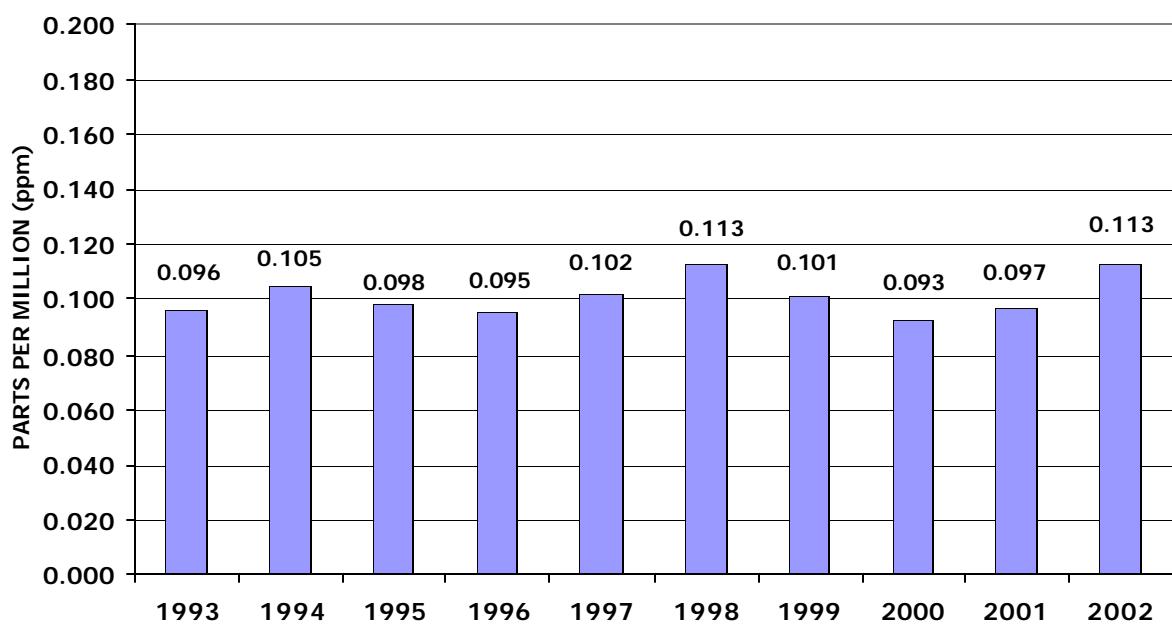
LOCATION/ STATION NO.	NO. DAILY OBS.	NUMBER OF DAILY MAXIMUM 1-HOUR CONCENTRATIONS IN RANGES							
		.00 to .04	.05 to .08	.09 to .12	.13 to .16	.17 to .20	.21 to .24	.25 to .28	>.28
NORTHERN REGION (CONTINUED)									
PRINCE WILLIAM CO. Long Park	45-L	206	42	139	24	1	0	0	0
STAFFORD CO.	44-A Widewater Elementary School	213	48	139	25	1	0	0	0
ALEXANDRIA	L-126-C 517 North Saint Asaph Street	213	70	118	22	3	0	0	0
FAIRFAX CO. HEALTH DEPT.									
FAIRFAX CO. 437 Balls Hill Road	L-46-A8	206	56	125	24	1	0	0	0
FAIRFAX CO.	L-46-B3 2675 Sherwood Hall Lane	213	64	119	27	3	0	0	0
FAIRFAX CO.	L-46-C1* Mason Governmental Center	205	61	108	34	2	0	0	0
FAIRFAX CO.	L-46-F Upper Cub Run Sewage Treatment Plant	214	43	148	22	1	0	0	0

* New Station

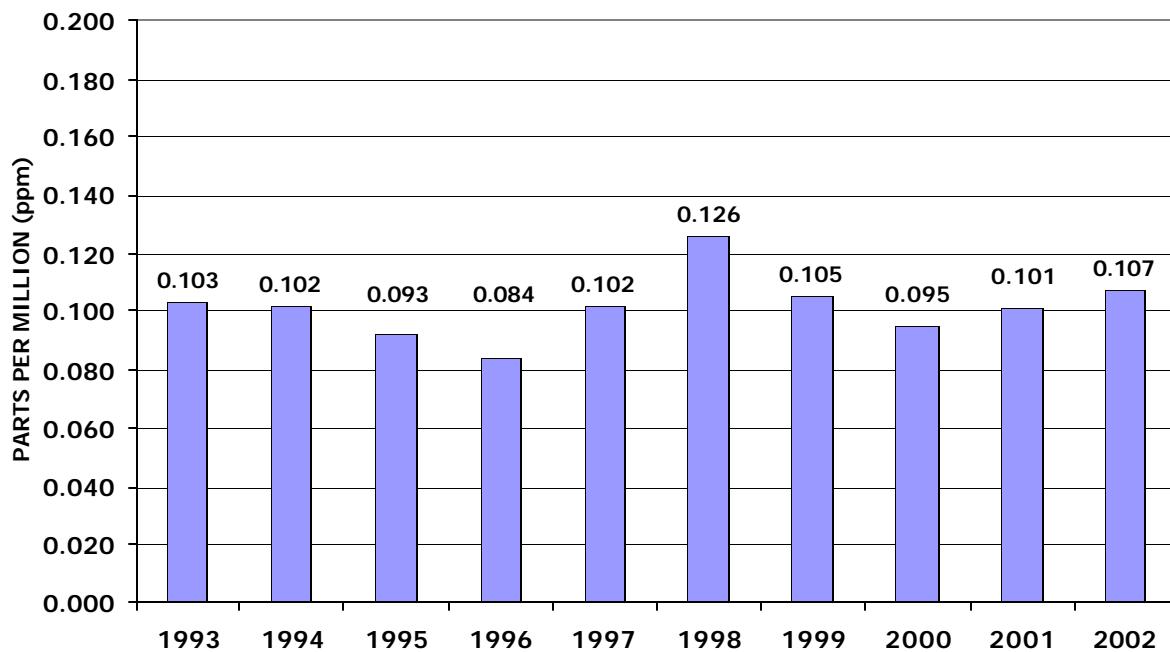
OZONE, SOUTHWEST REGION
2ND DAILY MAXIMUM, 1-HOUR VALUE
16-B, Rural Retreat, Wythe County



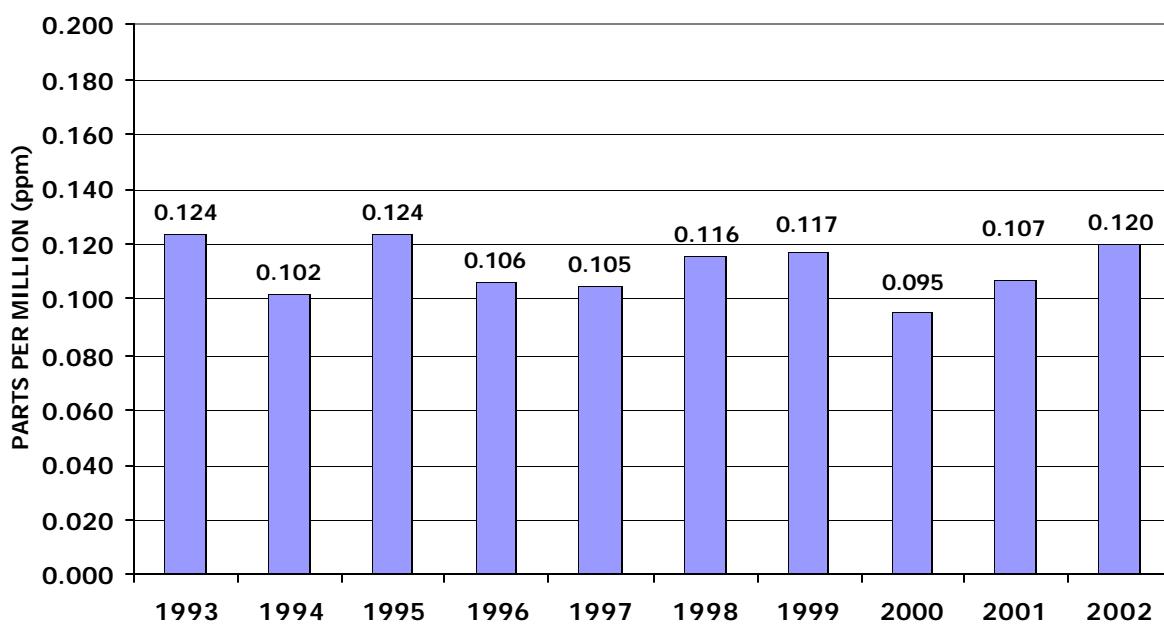
OZONE, VALLEY REGION
2ND DAILY MAXIMUM, 1-HOUR VALUE
28-J, Rest, Frederick County



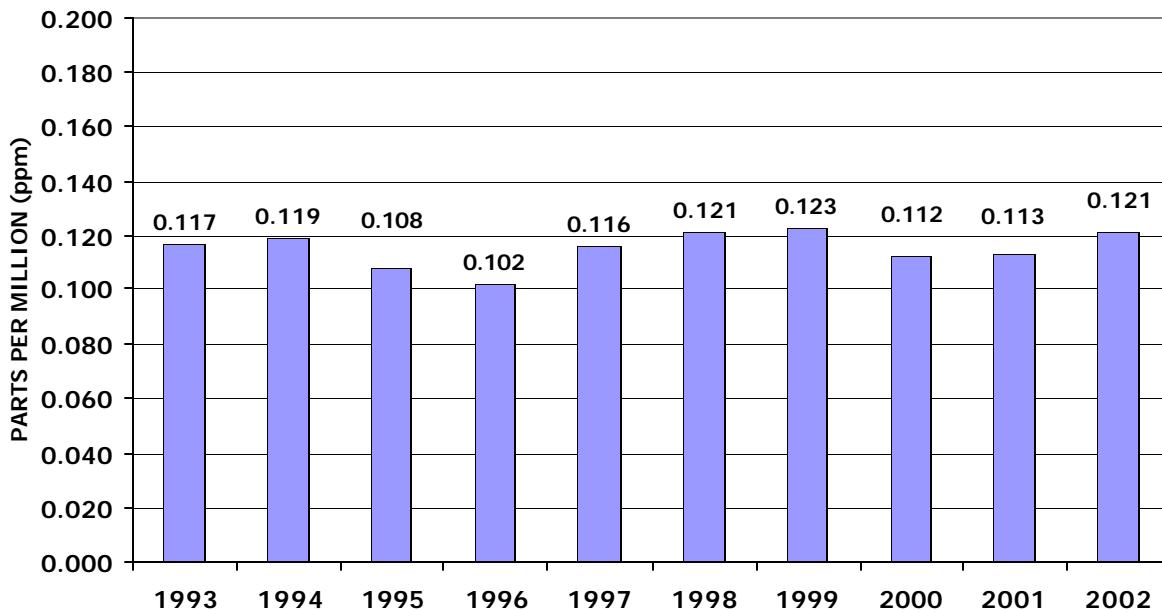
OZONE, WEST CENTRAL REGION
2ND DAILY MAXIMUM, 1-HOUR VALUE
19-A6, Vinton Elementary School, Roanoke Co.



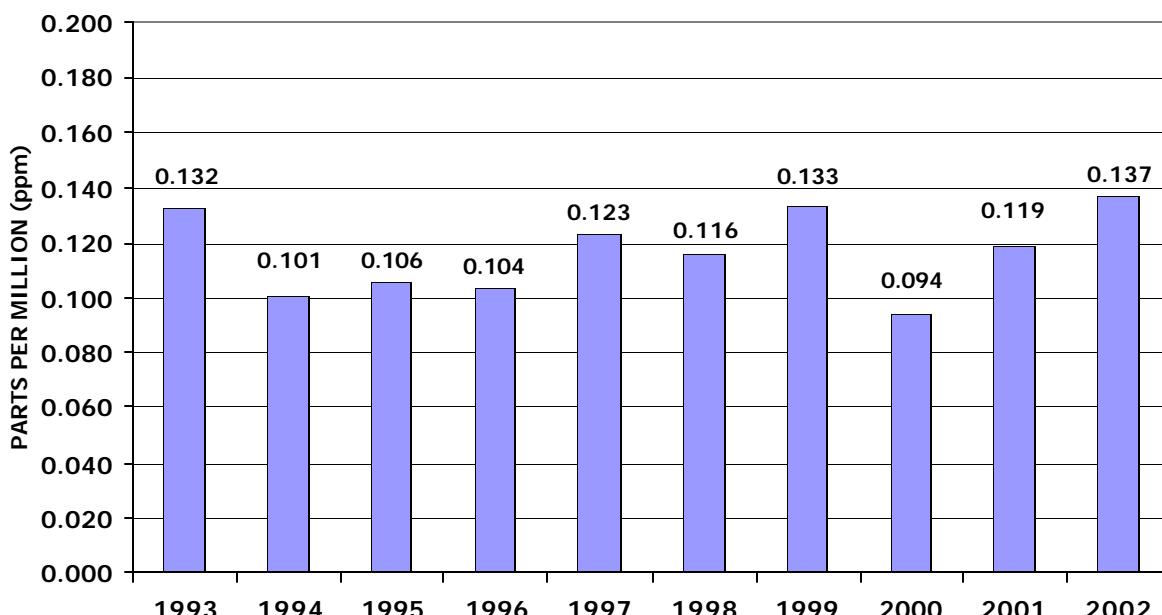
OZONE, PIEDMONT REGION
2ND DAILY MAXIMUM, 1-HOUR VALUE
71-H, Beach Road, Chesterfield County



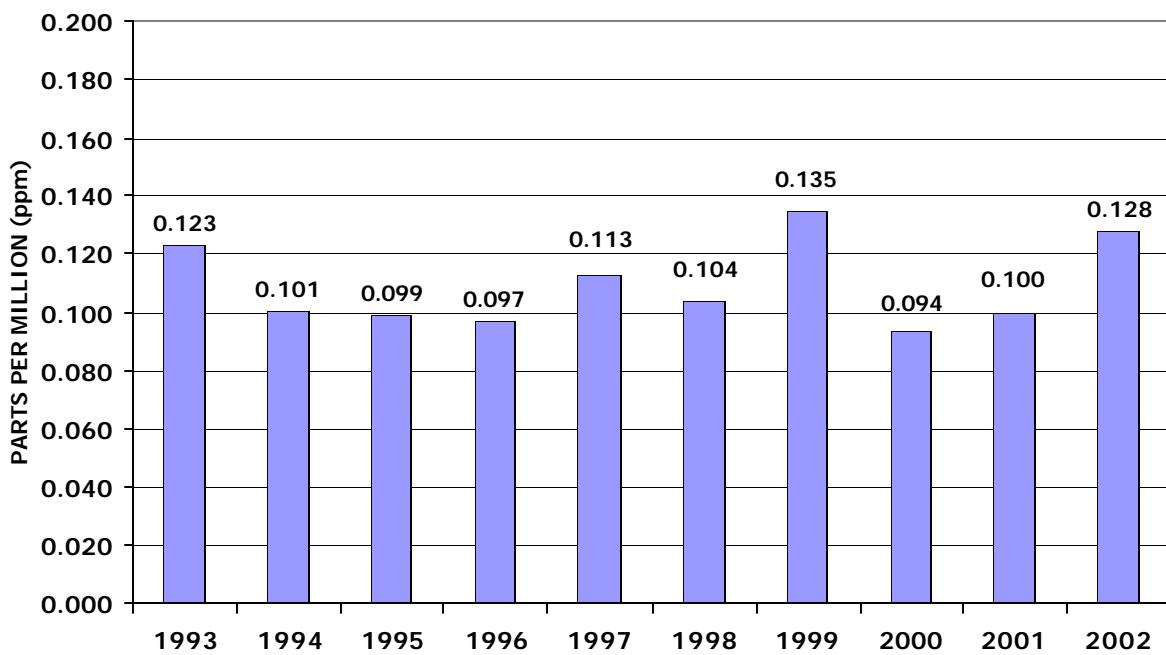
OZONE, PIEDMONT REGION
2ND DAILY MAXIMUM, 1-HOUR VALUE
72-M, Math & Science Center, Henrico County



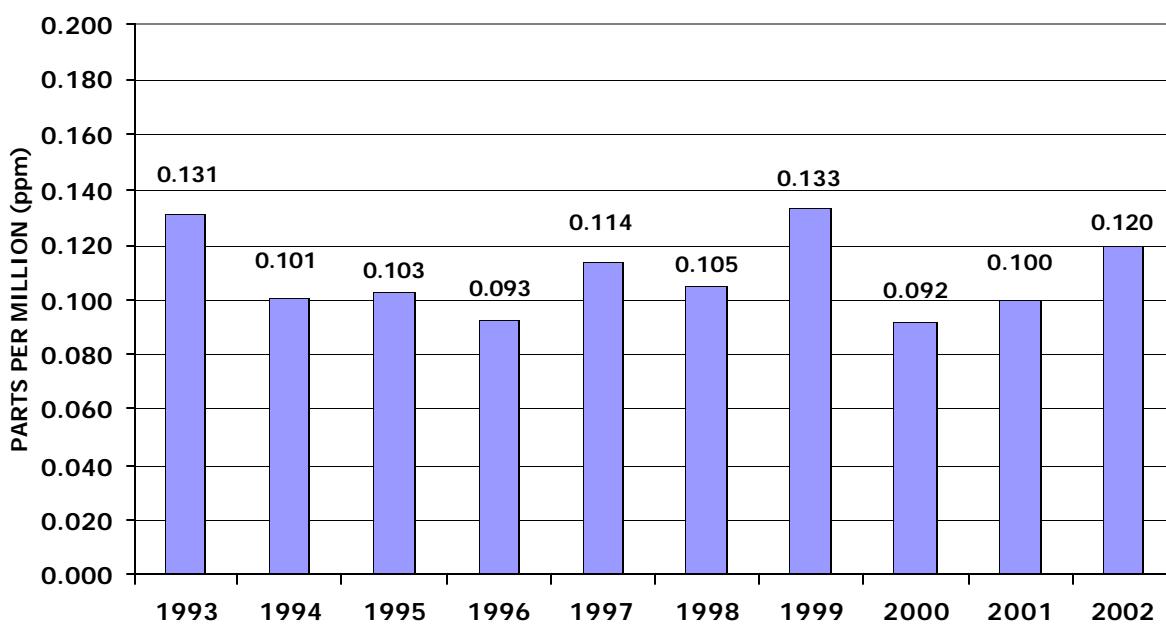
OZONE, PIEDMONT REGION
2ND DAILY MAXIMUM, 1-HOUR VALUE
75-B, Route 608, Charles City County



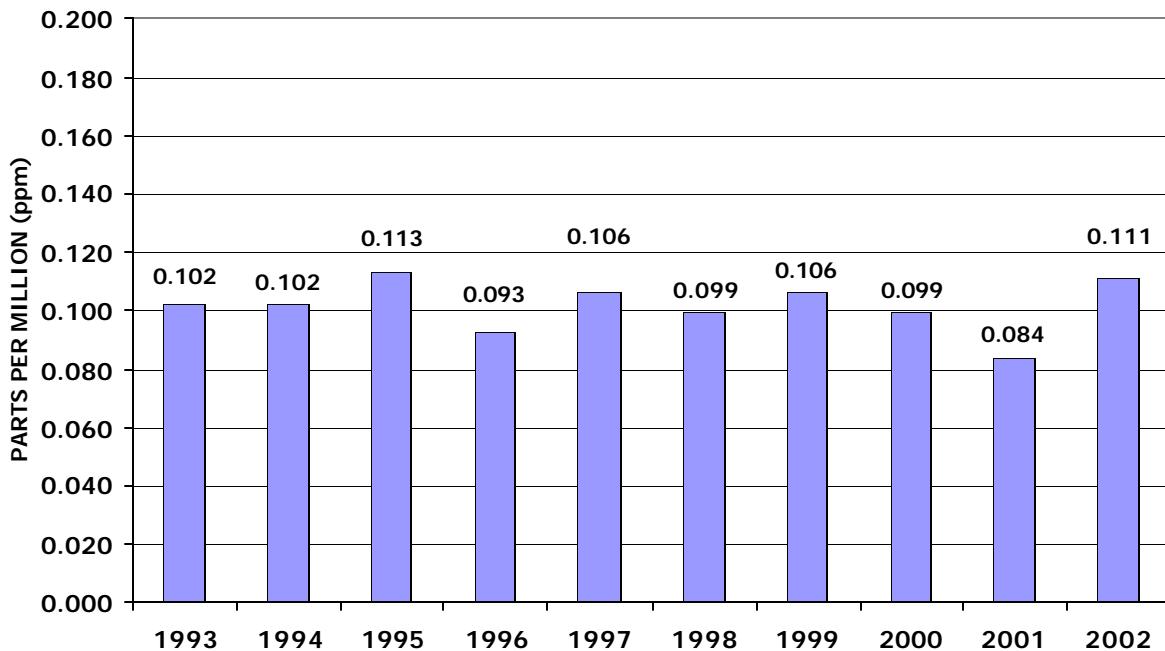
OZONE, TIDEWATER REGION
2ND DAILY MAXIMUM, 1-HOUR VALUE
179-C, Virginia School, Hampton



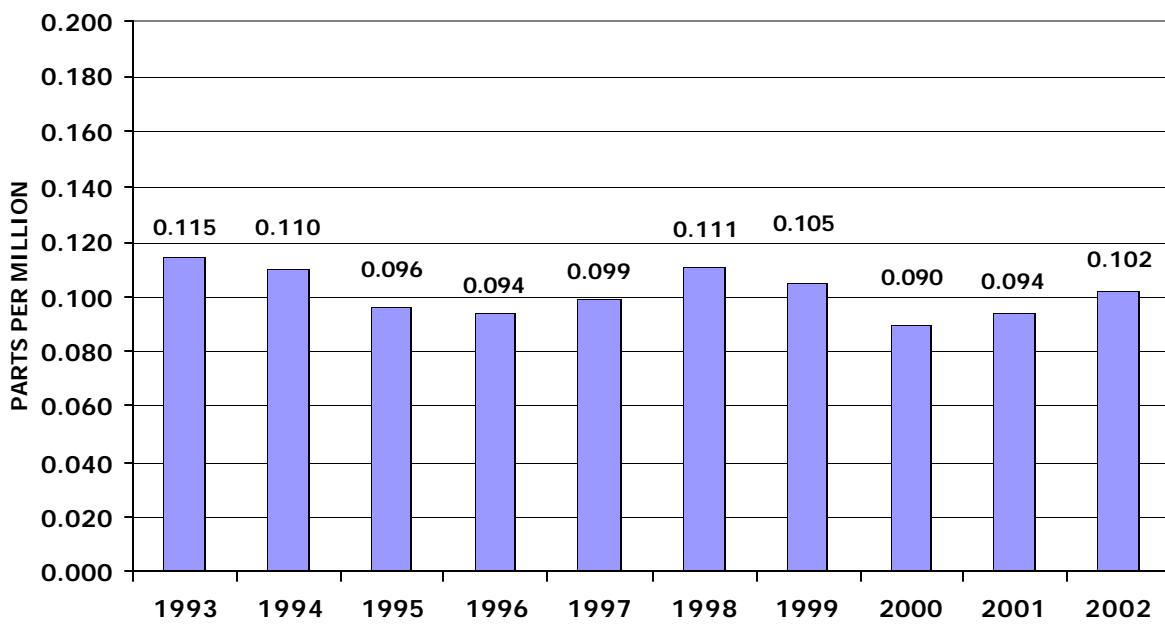
OZONE, TIDEWATER REGION
2ND DAILY MAXIMUM, 1-HOUR VALUE
183-E, Tidewater Community College, Suffolk



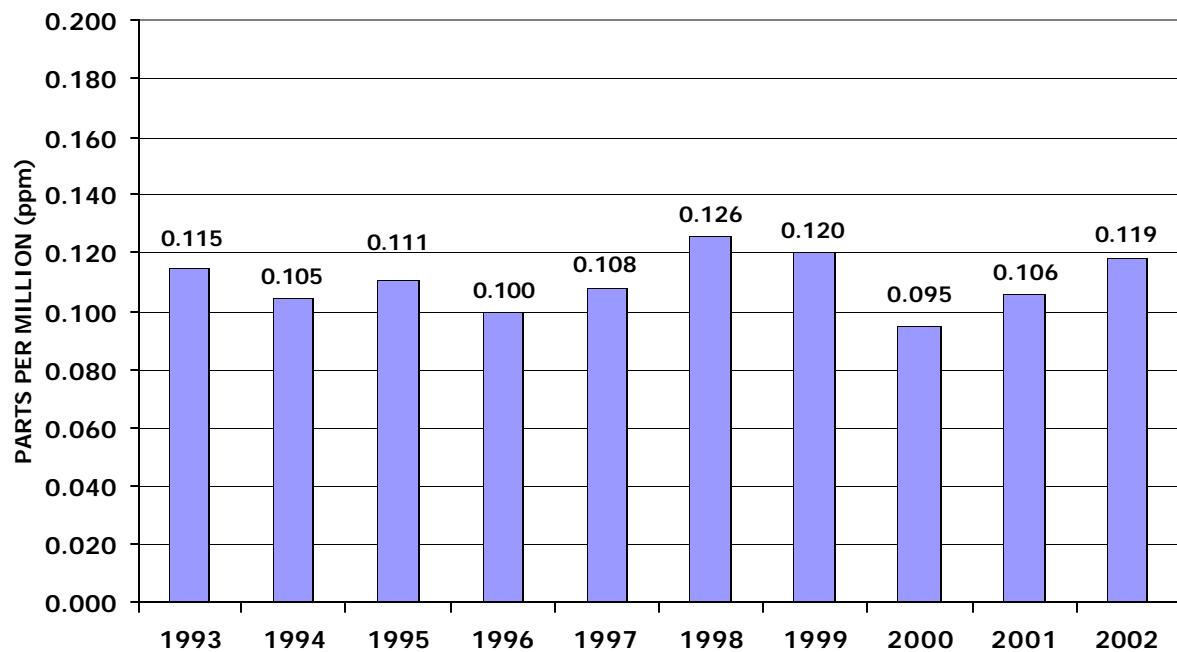
OZONE, TIDEWATER REGION
2ND DAILY MAXIMUM, 1-HOUR VALUE
183-F, Holland, Suffolk



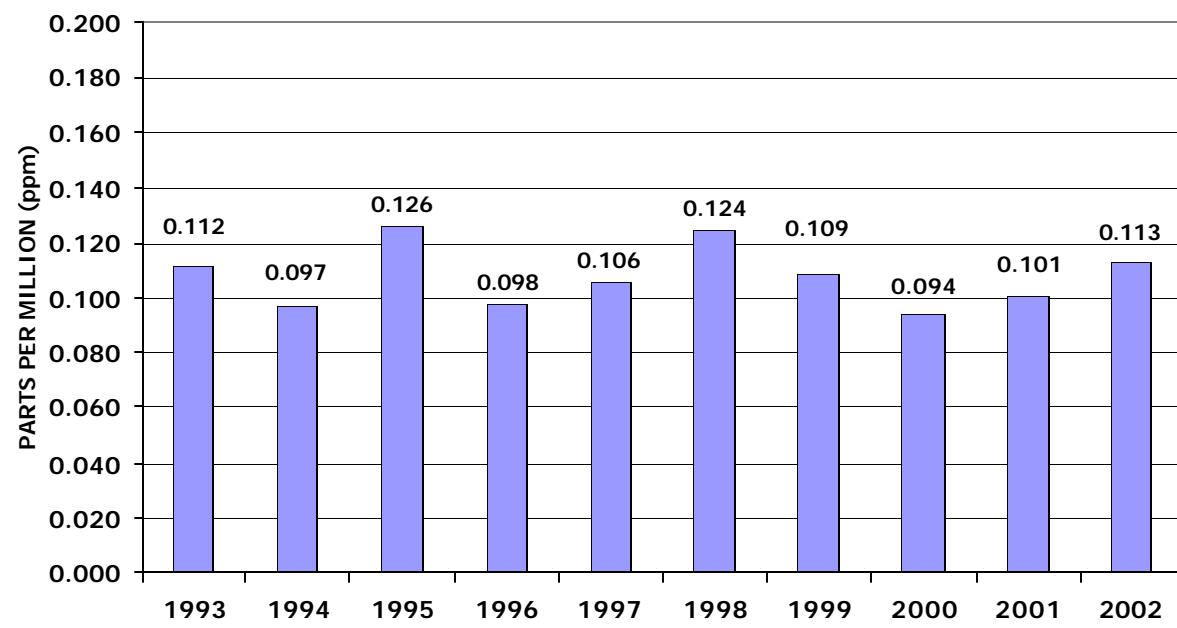
OZONE, NORTHERN REGION
2ND DAILY MAXIMUM, 1-HOUR VALUE
37-B, Phelps Wildlife Area, Fauquier County



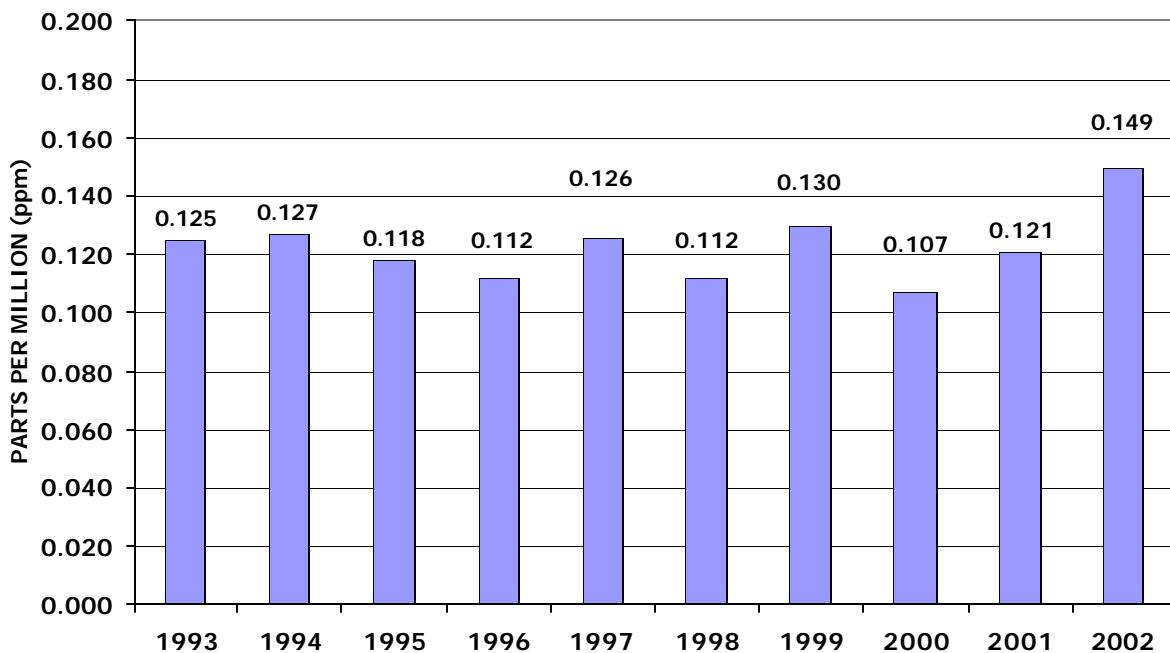
OZONE, NORTHERN REGION
2ND DAILY MAXIMUM, 1-HOUR VALUE
44-A, Widewater Elementary School, Stafford County



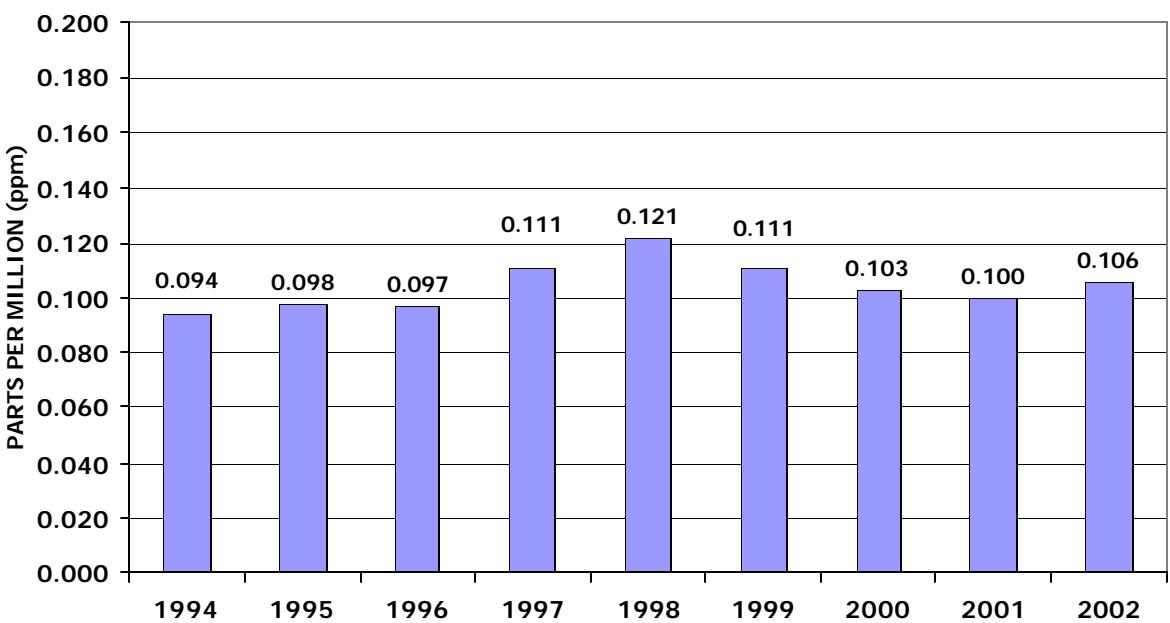
OZONE, NORTHERN REGION
2ND DAILY MAXIMUM, 1-HOUR VALUE
45-L, Long Park, Prince William County



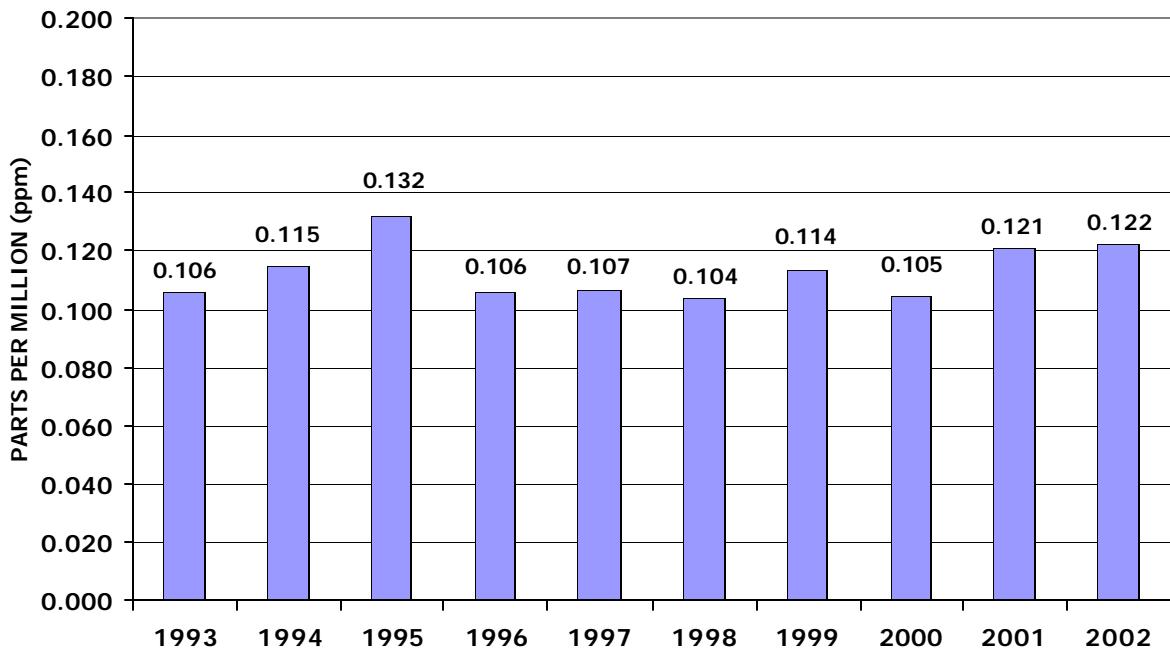
OZONE, NORTHERN REGION
2ND DAILY MAXIMUM, 1-HOUR VALUE
47-T, Aurora Hills Visitors Center, Arlington County



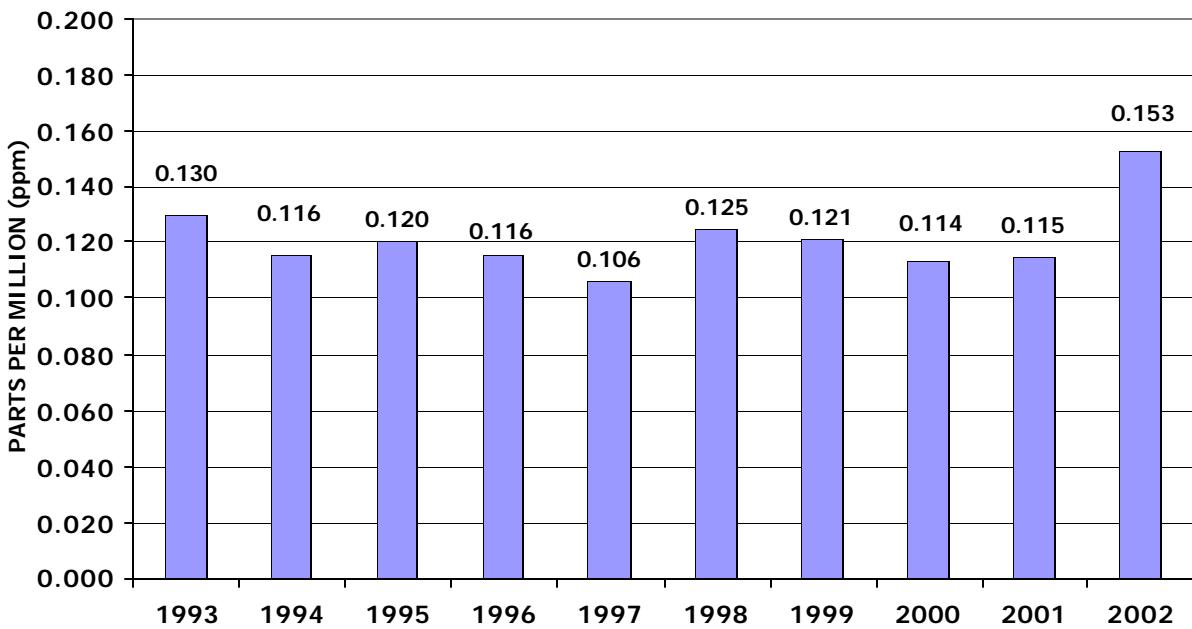
OZONE, NORTHERN REGION
2ND DAILY MAXIMUM, 1-HOUR VALUE
48-A, Corbin, Caroline Co.



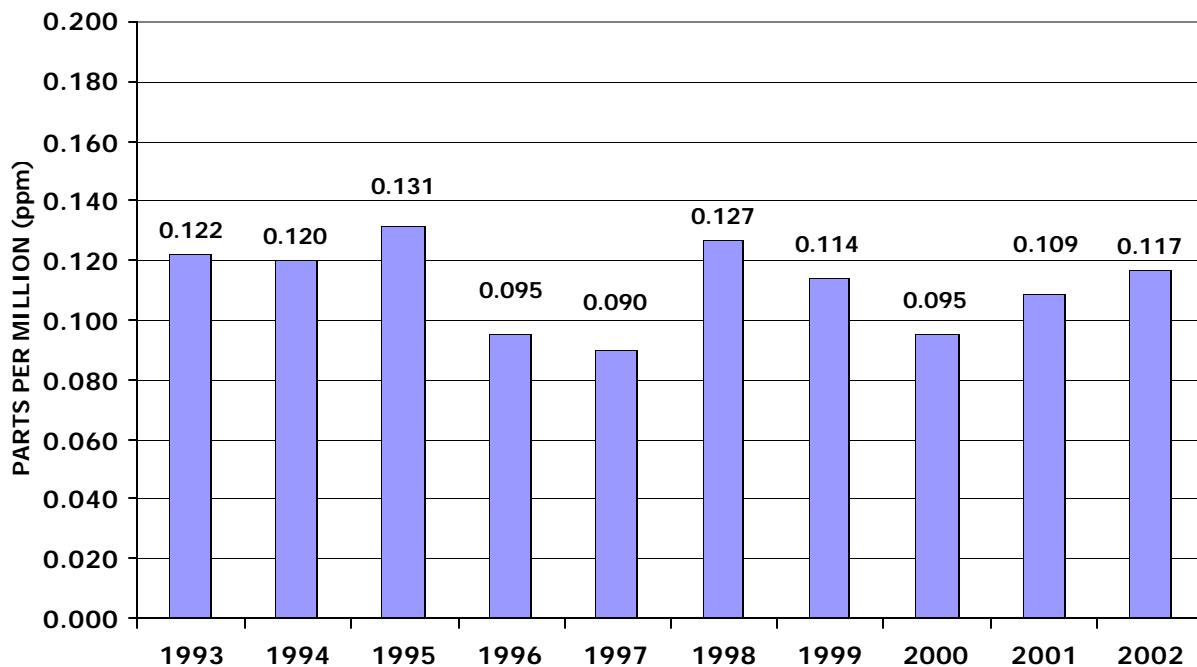
OZONE, FAIRFAX COUNTY
2ND DAILY MAXIMUM, 1-HOUR VALUE
L-46-A8, 1437 Balls Hill Road, McLean



OZONE, FAIRFAX COUNTY
2ND DAILY MAXIMUM, 1-HOUR VALUE
L-46-B3, 2675 Sherwood Hall Lane, Mt. Vernon



OZONE, FAIRFAX COUNTY
2ND DAILY MAXIMUM, 1-HOUR VALUE
L-46-F, Upper Cub Run Drive, Chantilly



**2002 VIRGINIA
OZONE EIGHT YEAR TREND
NUMBER OF DAYS WITH 1-HOUR AVERAGE CONCENTRATIONS > 0.12 ppm**

REGION/LOCATION	STATION NUMBER	1995	1996	1997	1998	1999	2000	2001	2002
SOUTHWEST REGION									
WYTHE CO., Rural Retreat	16-B	0	0	0	0	0	0	0	0
VALLEY REGION									
ROCKBRIDGE CO., Natural Bridge Ranger Station	21-C	--	--	--	--	0	0	0	0
FREDERICK CO., Rest	28-J	0	0	0	0	0	0	0	0
PAGE CO., Luray Caverns Airport	29-D	--	--	--	--	0	0	0	0
WEST CENTRAL REGION									
ROANOKE CO., Vinton	19-A6	0	0	0	2	0	0	0	0
PIEDMONT REGION									
CHARLES CITY CO., Route 608	75-B	0	0	1	1	5	0	0	3
CHESTERFIELD CO., Beach Road	71-H	1	0	0	0	0	0	0	1
HENRICO CO., Math & Science Center	72-M	1	0	1	1	1	0	1	1
HANOVER CO., McClellan Road	73-E	--	--	--	--	--	--	0	1
TIDEWATER REGION									
HAMPTON, Va. School for the Deaf & Blind	179-C	0	0	0	0	3	0	0	2
SUFFOLK, Tidewater Community College	183-E	0	0	0	0	3	0	1	1
SUFFOLK, Tidewater Research Station	183-F	0	0	0	0	0	0	0	0

**2002 VIRGINIA
OZONE EIGHT YEAR TREND
NUMBER OF DAYS WITH 1-HOUR AVERAGE CONCENTRATIONS > 0.12 ppm**

REGION/LOCATION	STATION NUMBER	1995	1996	1997	1998	1999	2000	2001	2002
NORTHERN REGION									
FAUQUIER CO., Phelps Wildlife Area	37-B	0	0	0	0	0	0	0	0
LOUDOUN CO., Broad Run High School	38-I	--	--	--	0	0	0	0	1
STAFFORD CO., Widewater Elementary School	44-A	0	0	0	2	1	0	0	1
PRINCE WILLIAM CO., Long Park	45-L	2	0	0	1	0	0	0	1
FAIRFAX CO., Lee District Park	46-B9	--	--	--	0	1	0	0	4
ARLINGTON CO., Aurora Hills Visitors Center	47-T	1	0	2	0	2	0	0	4
CAROLINE CO., U.S.G.S. Geomagnetic Center	48-A	0	0	0	1	0	0	0	0
ALEXANDRIA, 517 North St. Asaph Street	L-126-C	1	0	1	0	1	0	0	3
FAIRFAX COUNTY									
FAIRFAX CO., McLean Governmental Center, 1437 Balls Hill Road	L46-A8	2	0	0	0	1	0	1	1
FAIRFAX CO., Mt. Vernon Fire Station, 2675 Sherwood Hall Lane	L-46-B3	1	1	0	2	1	1	0	3
FAIRFAX CO., Annandale Mason Governmental Center	L-46-C1*	--	--	--	--	--	--	--	2
FAIRFAX CO., Upper Cub Run, Chantilly	L-46-F	2	0	0	2	0	0	0	1
TOTAL		11	1	5	12	19	1	3	30

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*New Station

2002 OZONE 1-HOUR AVERAGE CONCENTRATIONS > 0.12 PPM

REGION	STATION	LOCATION	EXCEEDANCE VALUE PPM	DATE	TIME (EST)
Piedmont	71-H	Chesterfield Co. , Beach Road	0.140	7/2/02	5:00 pm
	72-M	Henrico Co. , Math & Science Ctr.	0.140	8/13/02	3:00 pm
	73-E	Hanover Co. , McClellan Road	0.133	8/12/02	4:00 pm
	75-B	Charles City Co. , Route 608	0.164 0.137 0.131	7/17/02 8/13/02 6/10/02	3:00 pm Noon 3:00 pm
Tidewater	179-C	Hampton , Virginia School	0.134	7/17/02	5:00 pm
			0.128	8/13/02	2:00 pm
	183-E	Suffolk , Tidewater Community Coll.	0.125	7/4/02	11:00 am
Northern	47-T	Arlington Co. , Aurora Hills Visitors Center	0.151 0.149 0.139 0.131	7/2/02 6/25/02 8/2/02 8/12/02	3:00 pm 2:00 pm 1:00 pm 5:00 pm
	38-I	Loudoun Co. , Broad Run High School	0.132	9/10/02	4:00 pm
	45-L	Prince William Co. , Long Park	0.129	9/10/02	4:00 pm
	46-B9	Franconia , Lee District Park	0.148 0.137 0.129 0.126	8/13/02 7/2/02 8/2/02 6/25/02	4:00 pm 4:00 pm 1:00 pm 1:00 pm
	44-A	Stafford Co. , Widewater Elementary School	0.149	8/13/02	2:00 pm
	L-126-C	Alexandria , 517 North Saint Asaph St.	0.145 0.143 0.127	7/2/02 6/25/02 8/2/02	4:00 pm 1:00 pm 1:00 pm
	L-46-A8	Fairfax Co. , McLean Government Center	0.131	8/2/02	2:00 pm
	L-46-B3	Fairfax Co. , 2675 Sherwood Hall Lane	0.158 0.153 0.130	7/2/02 8/13/02 8/12/02	5:00 pm 3:00 pm 4:00 pm
	L-46-C1	Fairfax Co. , Mason Governmental Center	0.139 0.137	7/2/02 8/2/02	4:00 pm 2:00 pm
	L-46-F	Fairfax Co. , Upper Cub Run Treatment Plant	0.149	8/2/02	4:00 pm

References

Code of Federal Regulations - 40 CFR 58 - Appendix F

Virginia Ambient Air Monitoring Data Reports

"Guideline for the Interpretation of Air Quality Standards"

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Office of Air Quality Planning and Standards

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Air Quality System (AQS)

Quality Assurance Handbook for Air Pollution Measurement Systems
Environmental Protection Agency

Quality Assurance Manual for Air Pollution Measurement Systems

Commonwealth of Virginia

Department of Environmental Quality

Air Pollution Training Institute

Introduction of Environmental Statistics

Statistical Evaluation Methods for Air Pollution Data

Atmospheric Sampling